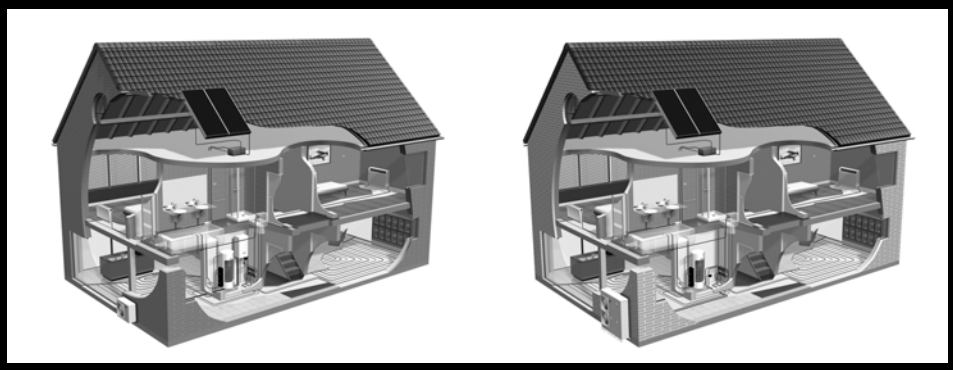
DACA-EEDEN09-720

Engineering Data



DaikinAltherma

R-410A

altherma

Daikin Altherma Engineering Data

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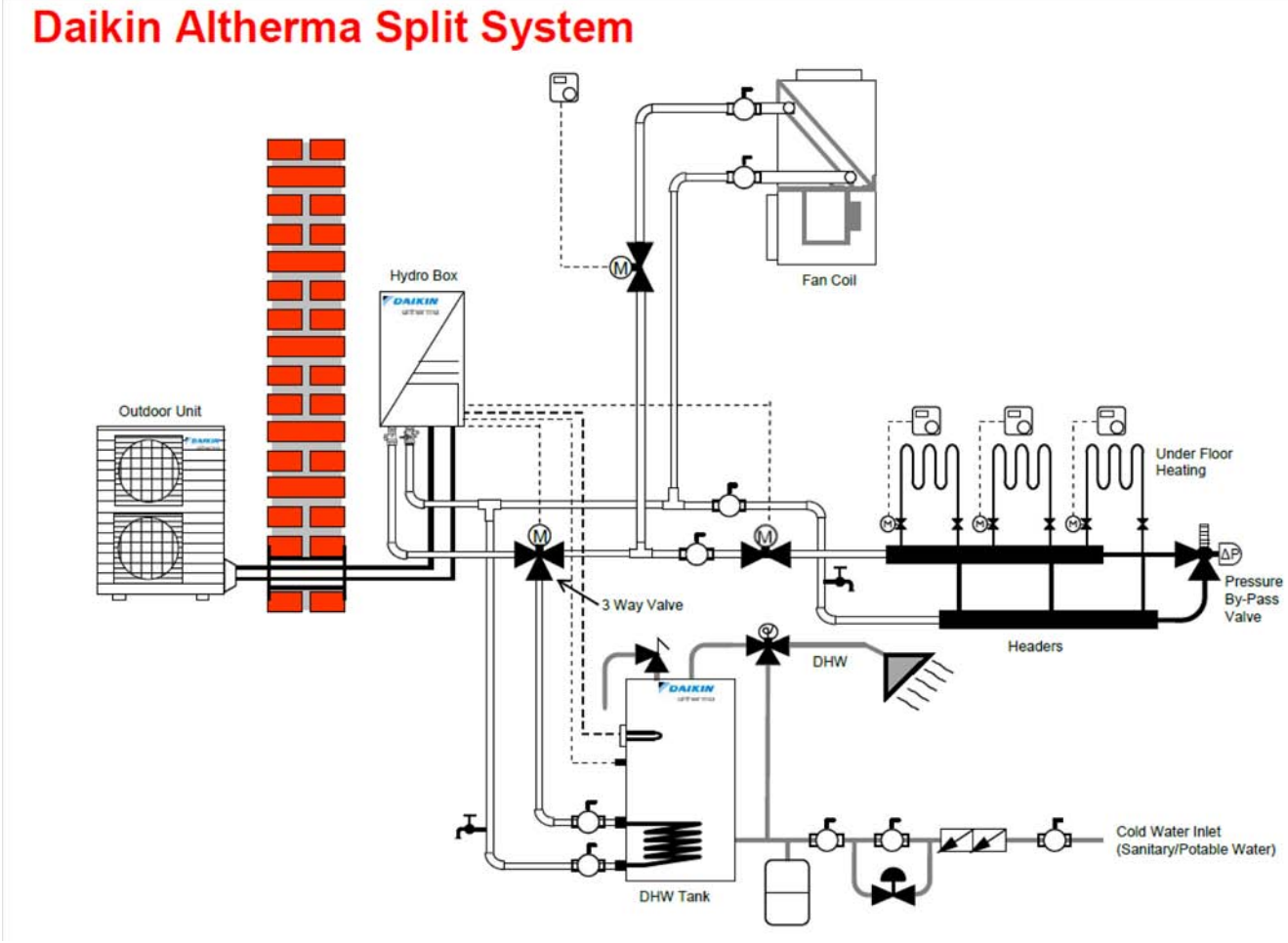
1. Daikin Altherma Overview

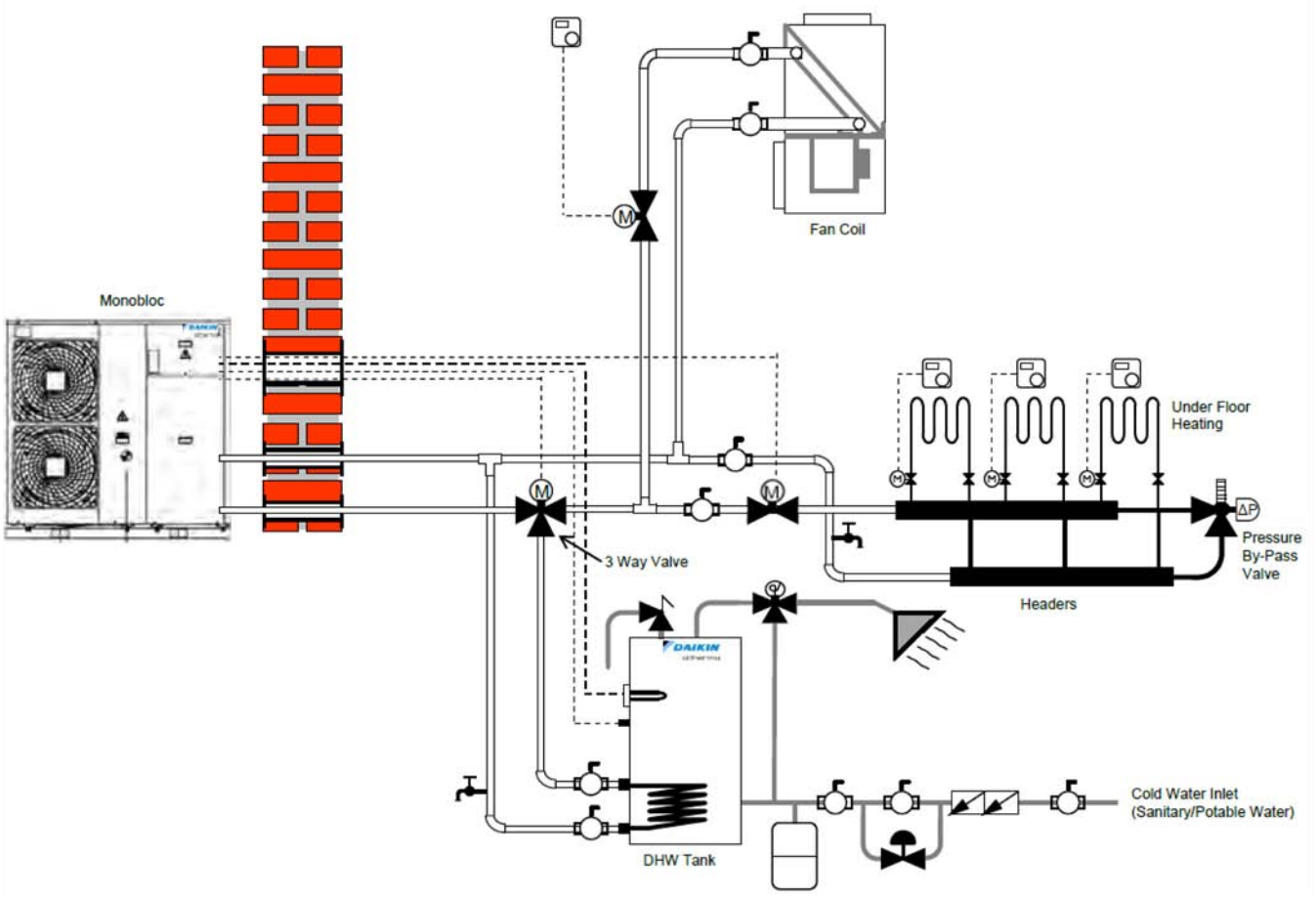
1.1 Daikin Altherma Split System

Daikin Altherma is a Total Comfort air-to-water heat pump system that utilizes an outdoor R-410A heat pump system, with Inverter controlled compressor, to extract heat from the outdoor air and transfers this heat through refrigerant piping to a refrigerant-to-water cupro-nickel brazed plate heat exchanger in the hydrobox (indoor unit on split system and incorporated in the outdoor unit on the monobloc). The hydrobox circulates the heated water through low temperature heat emitters (low temperature radiators, floor heating systems and fan coil units) and also provides domestic hot water (DHW) with the optional DHW tank (316L stainless steel heat exchanger and tank). The heat pump version of the hydrobox can reverse the cycle and provide chilled water for cooling through fan coil units (fan coil units for cooling are field supplied and must have a condensate drain pan). Daikin Altherma can heat spaces, produces domestic hot water and with the heat pump version hydrobox or monobloc can cool spaces.

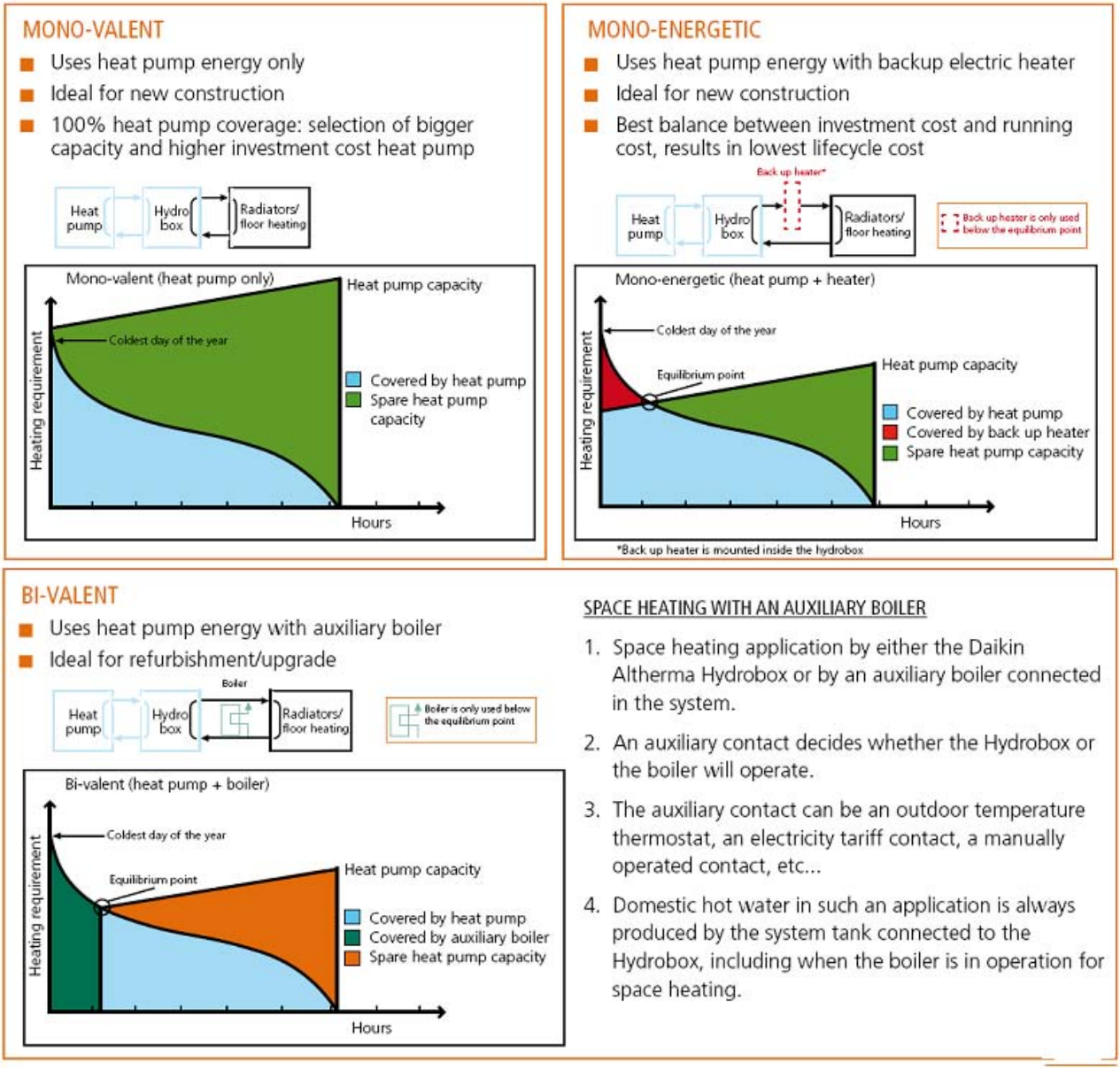
The high coefficient of performance (COP) of the Daikin Altherma heat pump is largely attributed to the Daikin inverter principle. An integrated frequency converter adjusts the rotational speed of the compressor to suit the heating (cooling) demand. The system seldom operates at full capacity and maximizes efficiency by controlling the compressor rpm.



1.2 Daikin Altherma Monobloc System



1.3 System Configurations


MONO-VALENT
Uses heat pump energy only
Ideal for new construction
100% heat pump coverage: selection of bigger capacity and higher investment cost heat pump
Heat pump
Hydro box
Radiators/ floor heating
Mono-valent (heat pump only)
Heat pump capacity
Coldest day of the year
Heating requirement
Covered by heat pump
Spare heat pump capacity
Hours
MONO-ENERGETIC
Uses heat pump energy with backup electric heater
Ideal for new construction
Best balance between investment cost and running cost, results in lowest lifecycle cost
Back up heater*
Back up heater is only used below the equilibrium point
Mono-energetic (heat pump + heater)
Coldest day of the year
Equilibrium point
Heat pump capacity
Covered by heat pump
Covered by back up heater
Spare heat pump capacity
*Back up heater is mounted inside the hydrobox
BI-VALENT
Uses heat pump energy with auxiliary boiler
Ideal for refurbishment/upgrade
Boiler
Boiler is only used below the equilibrium point
Bi-valent (heat pump + boiler)
Covered by auxiliary boiler
SPACE HEATING WITH AN AUXILIARY BOILER
1. Space heating application by either the Daikin Altherma Hydrobox or by an auxiliary boiler connected in the system.
2. An auxiliary contact decides whether the Hydrobox or the boiler will operate.
3. The auxiliary contact can be an outdoor temperature thermostat, an electricity tariff contact, a manually operated contact, etc...
4. Domestic hot water in such an application is always produced by the system tank connected to the Hydrobox, including when the boiler is in operation for space heating.

Selection Conditions
Typical conditions for the heating LWT are:

86 to 95° F (at design conditions) for floor heating

86 to 113° F (at design conditions) for fan coil units

104 to 122° F (at design conditions) for low temperature radiators

2. The Basics of Daikin Altherma

2.1 Air-to-Water Heat Pump

DAIKIN altherma

AIR-TO-WATER HEAT PUMP

THE BASICS

The system consists of 5 components which together to provide the ideal comfort and water temperature.

1A / OUTDOOR UNIT : AN EFFICIENT USE OF ENERGY FROM THE AIR

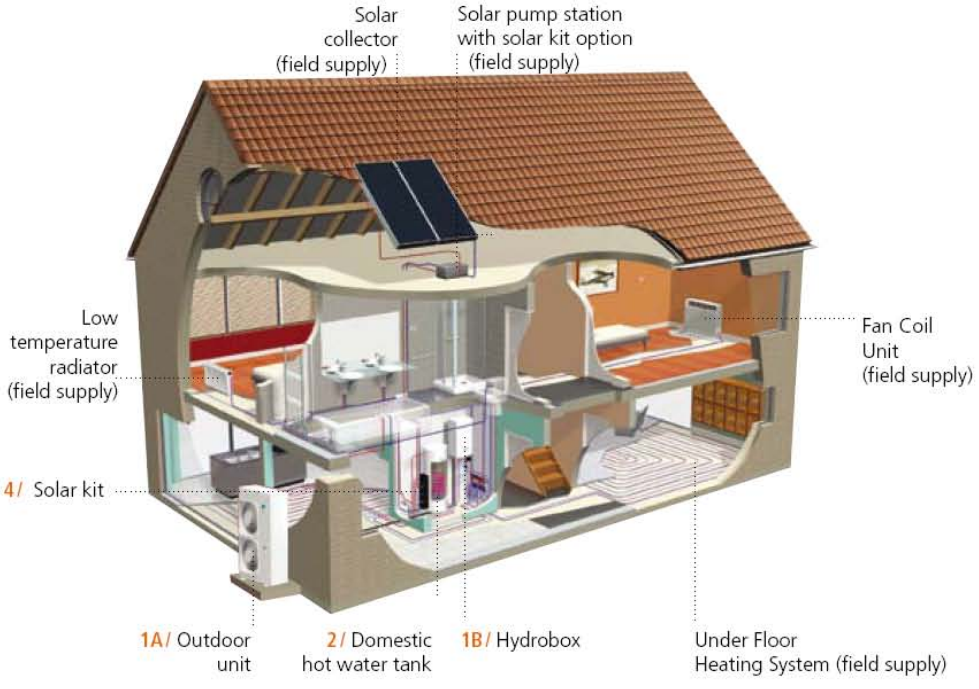
Daikin Altherma uses a natural source of energy. The outdoor unit extracts heat from the outside air and transfers it inside through refrigerant piping to supply heating. The compact outdoor unit is easily installed and, as no drilling or excavation work is required, it can also be installed in condos and apartments.

1B / HYDROBOX : THE HEART OF THE DAIKIN ALTHERMA SYSTEM

The hydrobox heats the water that circulates through low temperature radiators, floor heating systems or fan coil units and also provides domestic hot water. If you opt for the combination of heating and cooling, then the hydrobox can also reverse the cycle to provide lower water temperatures and thus cooling to the home.

2 / DOMESTIC HOT WATER TANK : FOR LOW ENERGY CONSUMPTION

As for your domestic hot water, Daikin Altherma is just as clever. The unique lay-out and special placement of the system components maximize energy efficiency. The water inside the storage tank is primarily warmed up by thermal energy from the outside air, thanks to a heat exchanger connected to the heat pump. However, an additional electrical heating element in the domestic water tank can take care of extra heat required in the shower, tub or sink. At necessary intervals the water is automatically heated to 158°F or more to prevent the risk of bacteria growth. With Daikin Altherma, delightfully warm and perfectly safe water can be enjoyed at all times. Depending on the daily consumption of hot water, Daikin Altherma domestic hot water tanks are available in two different sizes.


Solar collector (field supply)
Solar pump station with solar kit option (field supply)
Low temperature radiator (field supply)
Fan Coil Unit (field supply)
4/ Solar kit
1A/ Outdoor unit
2/ Domestic hot water tank
1B/ Hydrobox
Under Floor Heating System (field supply)

3 / MONOBLOC OUTDOOR UNIT: ALL IN ONE

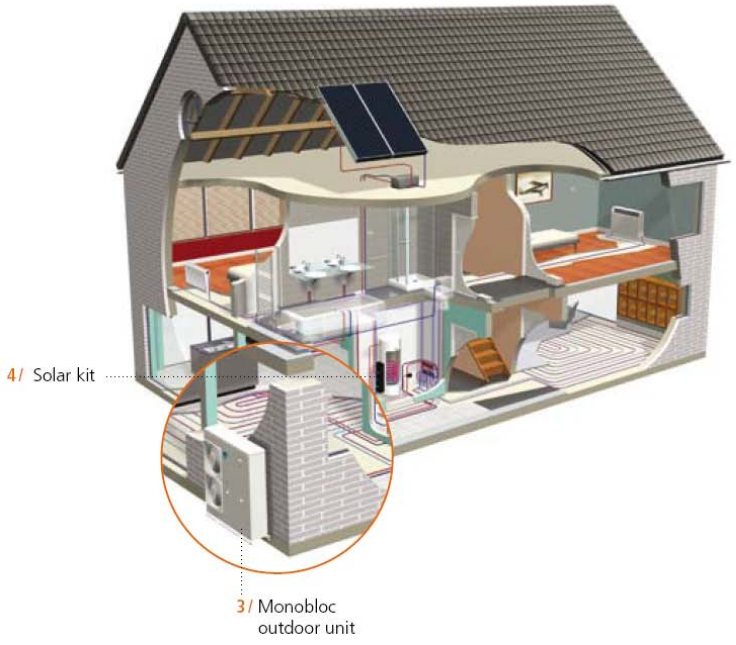
In addition to Daikin Altherma Split type systems, Daikin has a monobloc version in which the hydrobox components are located within the outdoor unit. In this new system, the water pipes, rather than refrigerant lines, run indoors from the outdoor unit, making installation much quicker and easier for the installer.

4 / SOLAR KIT

The solar kit provides the transfer of solar heat to the Daikin Altherma hot water tank via an external heat exchanger. In contrast to tanks with two heat exchangers, this system allows the entire content of the tank to be efficiently heated with solar heat and, if necessary, with heat pump energy.

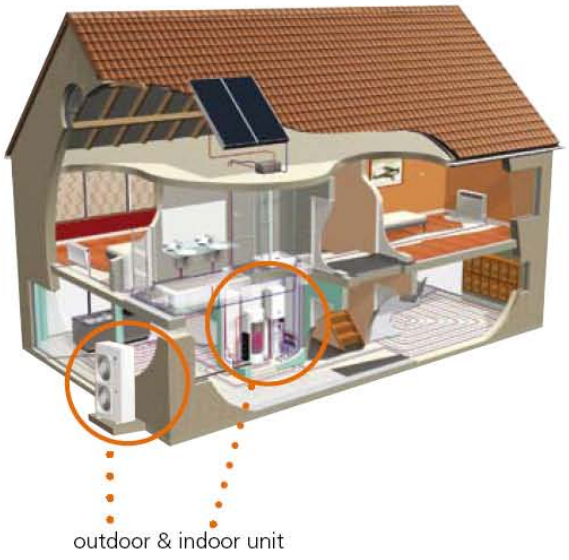
5 / ROOM THERMOSTAT

With the wired room thermostat, the ideal temperature can be easily, quickly and conveniently regulated.



2.2 Split Type

Daikin offers you the choice between a Daikin Altherma system with an outdoor unit and indoor unit, or a Daikin Altherma Monobloc System, in which the hydrobox components are located within the outdoor unit.

	DAIKIN ALTHERMA SPLIT TYPE
Application	Heating and (optional) cooling (+ domestic hot water)  outdoor & indoor unit
Heat pump type	Outdoor (compressor) unit + Indoor (hydronic parts) unit
R-410A refrigerant piping	Between outdoor unit and indoor unit
H_2O piping	Between indoor unit and indoor heating appliances
Installer's advantages	No extra insulation of H_2O piping required to protect from freezing up

The Split system can be combined with
- Under floor heating
- Fan coil units
- Low temperature radiators to provide your customers the comfort they require.

In addition, the Split system can be connected to
- A domestic hot water tank to supply your customer's hot water needs
- Solar collectors, with optional solar kit, to compliment the production of hot water
- A room thermostat, to regulate the ideal temperature easily, quickly and conveniently.

2.3 Monobloc

	DAIKIN ALTHERMA MONOBLOC
Application	Heating and (optional) cooling (+ domestic hot water)
Heat pump type	Outdoor unit only (compressor and hydronic parts combined)
R-410A refrigerant piping	Inside outdoor unit
H_2O piping	Between outdoor unit and heating terminal units
Installer's advantages	Only H_2O piping needed to install the system

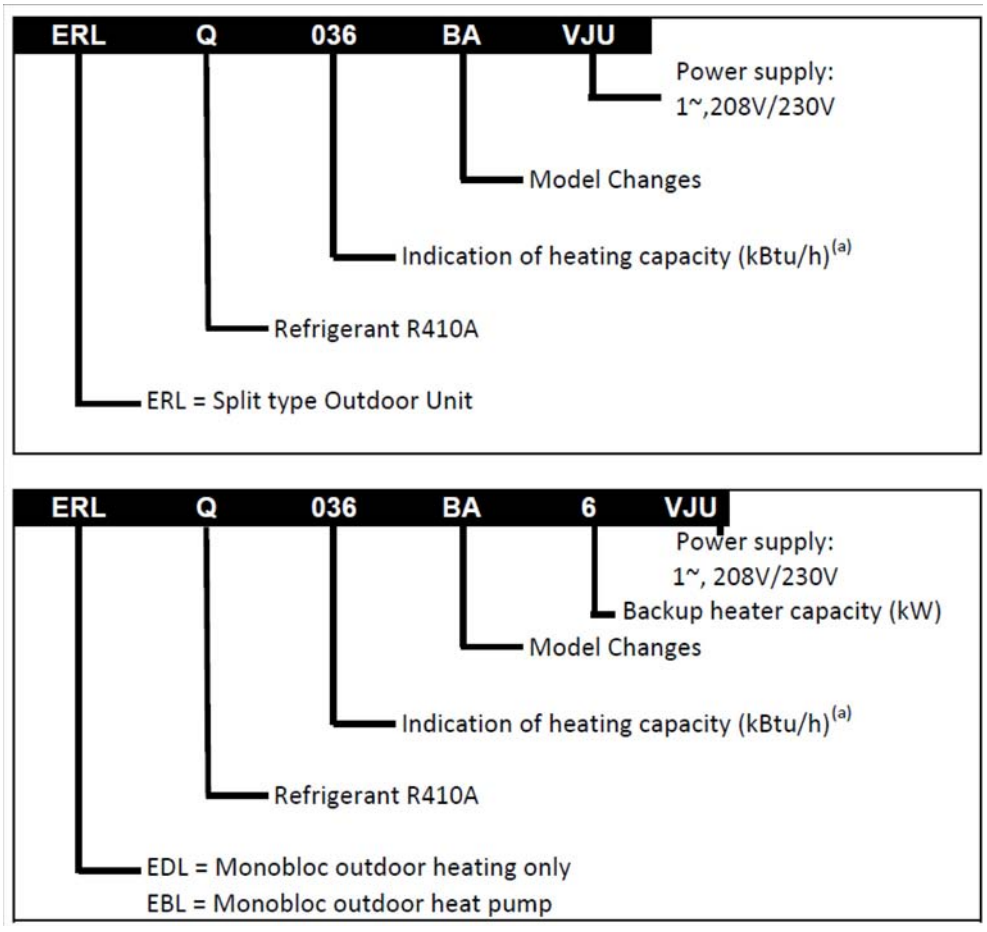
monobloc outdoor unit

The monobloc system can be combined with
- Under floor heating
- Fan coil units
- Low temperature radiators to provide your customer the comfort they require.

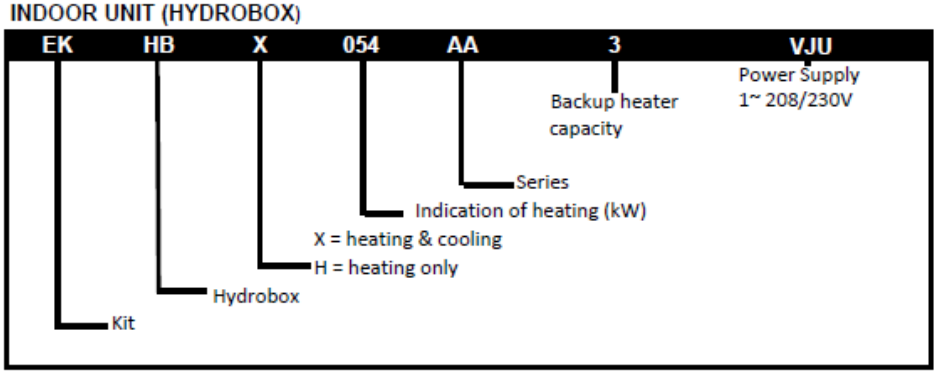
In addition, the monobloc system can be connected to
- A domestic hot water tank to supply your customer's hot water needs
- Solar collectors, with optional solar kit, to compliment the production of hot water
- A room thermostat, to regulate the ideal temperature easily, quickly and conveniently.

3. Model Indentification

3.1 Outdoor Units

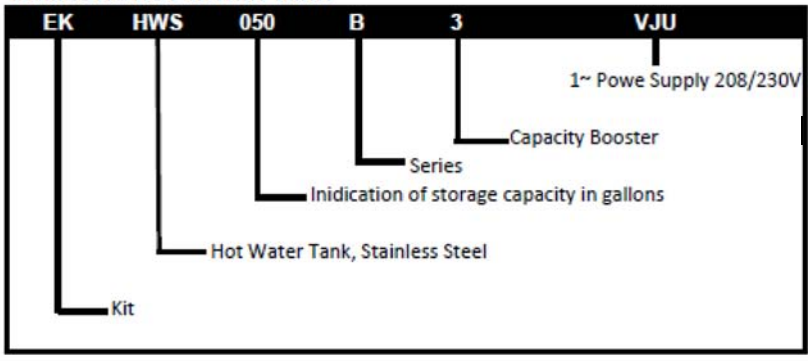


3.2 Indoor Units

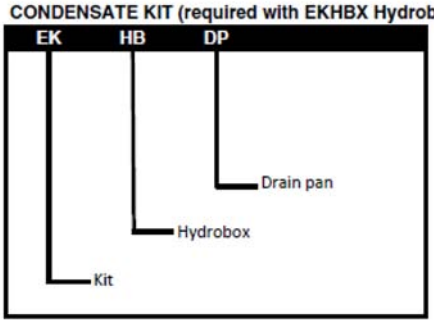


3.3 Options

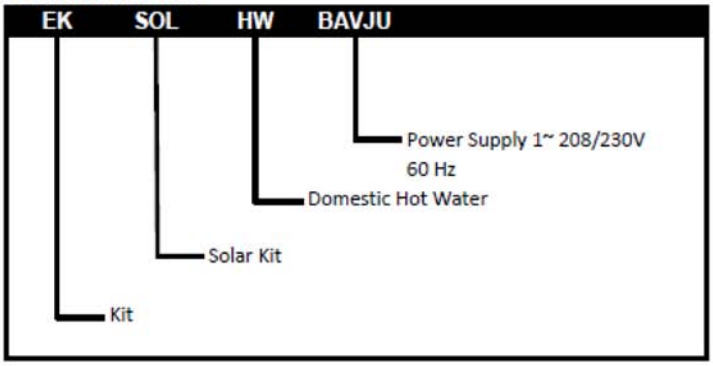
DOMESTIC HOT WATER TANK



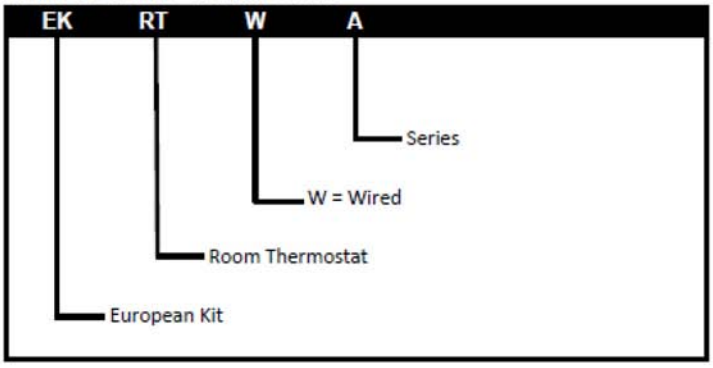
CONDENSATE KIT (required with EKHBX Hydrobox)



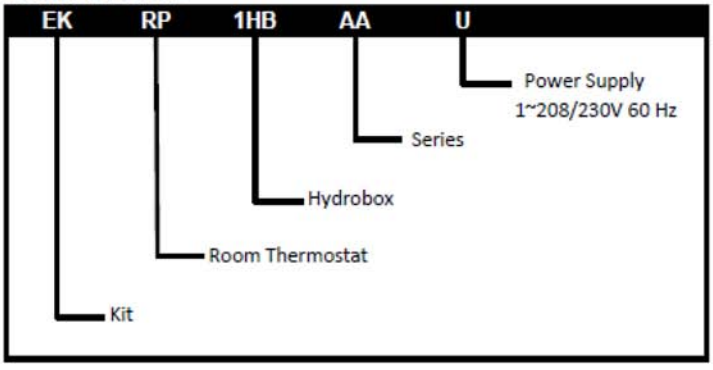
SOLAR PUMP KIT



REMOTE WIRED THERMOSTAT



DIGITAL I/O PCB



4. System and Design Recommendations

Daikin Altherma System Design and Operation Recommendations

Three (3) steps for a good design:

1) Accurate calculations of heat losses (transmission and ventilation losses).
2) Selection of Daikin Altherma based on heat loss calculation and preferably for low water temperature application (95°F/35°C to 104°F/40°C). Use the available Daikin Altherma selection and software tools (use Daikin Altherma Checklist for selection inputs).
3) Selection of heat emitters should be based on operating temperature, flow rate, and heat output characteristics.

Design hint: If the heat losses exceed the single total Altherma capacity at design ambient conditions, multiple Altherma system may be used in unison to aid greater DHW consumption or larger heating loads in single zones. For multiple zones it is highly recommended to utilize multiple (separate) systems. Daikin Altherma can also be applied using an auxiliary boiler connected in parallel (Bi-Valent application)

Recommended Altherma leaving water temperature (LWT) selections conditions:

Typical conditions for the heating LWT are:

86°F/30°C to 95°F/35°C (at design conditions) for floor heating
86°F/30°C to 113°F/45°C (at design conditions) for fan coil units
104°F/40°C to 122°F/50°C (at design conditions) for low temperature radiators

Operating the System:

To get the most comfort with the lowest energy consumption with Daikin Altherma, it is very important to observe the following items:

- Define possible schedule timer actions for each day by filling out the form at the end of the operation manual can help minimize energy consumption.
- Make sure the heat pump system works at the lowest possible hot water temperature to heat the home. To optimize this, make sure the weather dependent set point (outdoor reset) is used and configured to match the installation environment (use the available selection and software tool).

- It is advised to install the Daikin room thermostat (EKRTWA) connected to the hydrobox section. This will prevent excessive space heating and will stop the outdoor unit and circulator pump when the room temperature is above the thermostat set point.

Next recommendations apply to installations with an optional domestic hot water (DHW) tank:

- Make sure the DHW is only heated up to the temperature required.
- Make sure the DHW heating by the booster heater located in the DHW tank is enabled 1 to 2 hours before the expected DHW usage (refer to the DHW heating and booster heating schedule timer programming in the operation manual).

Refer to combination overview and component selection on the following pages:

Quote #: ☐

Daikin Altherma Checklist

Low Temperature Mode

Job Name: _____ **Date:** _____

Customer: _____ **Required by:** _____

Contact: _____ _____ **PO:** _____

A) Sizing Information:

Outdoor Temperature Where Heat Loss = Zero: _____ Night Setback Temperature: _____

Heat Loss: _____ Btu/h Heating Months: _____

Heat Gain (if cooling): _____ Btu/h Total Area _____ Square Feet

Energy Cost: Electricity____kW; Gas____Therm; Oil____gal Peak / Standard Demand Charge Period_____

Details: _____

B) System Selection:

System Layout:

☐ Split System (R410A piping to indoor hydrobox)

☐ Monobloc (packaged unit) (H_2O piping to inside) (Includes 6 kW 2-stage backup heater)

System Type:

Backup heater selection is not applicable to Monobloc

☐ Heating Only EKHBH-Split System / EDLQ-Monobloc

☐ Heat Pump (Heating & Cooling) EKHBX-Split System / EBLQ-Monobloc

☐ 3 kW Backup heat capacity ☐ 6kW Backup heat capacity 2-stage

System Criteria:

☐ Heating (LWT _____°F/°C) (Maximum temperature 131°F / 55°C)

☐ Cooling (LWT _____°F/°C) (EKBDHP Condensate Kit Required)

☐ DHW (Water Temp _____°F/°C)

System Source:

☐ 100% Heat Pump (Mono-Valent)

☐ Heat Pump w/Electric Heater (Mono-Energetic)

☐ Heat Pump with Auxiliary Boiler (Bi-Valent)

Heat Emitters: Dual Setpoint Temperature:_____high_____low

Type	Heat or Cool	Capacity Btu/h	CFM-Fan Coil	Additional Heat EmitterSpecifications
Radiant Floor				
86 to 95°F / 30 to 35°C				
Fan Coil				
86 to 113°F / 30 to 45°C				
Low Temp Radiators				
104 to 122°F / 40 to 50°C				

Domestic Hot Water:

☐ 50 Gallon (Integrated 3kW booster heater)

☐ 80 Gallon (Integrated 3kW booster heater)

☐ Optional Solar Kit (connection kit to storage tank only)

Solar Option:

☐ Storage Tank Connection Kit (connection kit to storage tank only)

☐ Control Board Interface (PCB)

Thermostats:

☐ Daikin Thermostat (EKRTWA) (Wired to hydro box)

☐ Zone Thermostats (by others)

☐ Room Thermostat (by others) (Wired to hydro box) Must have 6 min. run time

Notes:

☐ Order # _____ ☐ Date_____ ☐ Person_____

Version 3 (2009)

5. Combination Overview

Daikin Altherma Split System Combination Overview		Hydrobox Heating Only		Hydrobox Heat Pump (Reversible)	
		EKHBH054BA3VJU	EKHBH054BA6VJU	EKHBX054BA3VJU	EKHBX054BA6VJU
Outdoor Unit	ERLQ036BAVJU	X	X	X	X
	ERLQ048BAVJU	X	X	X	X
	ERLQ054BAVJU	X	X	X	X
DHW Tank (50 gal)	EKHWS050BA3VJU	X	X	X	X
DHW Tank (80 gal)	EKHWS080BA3VJU	X	X	X	X
Digital I/O PCB	EKRP1HBAAU	1	1	1	1
Solar Pump Kit	EKSOLHWBAVJU	2	2	2	2
Wired Thermostat	EKRTWA	X	X	X	X
Condensate Kit	EKHBDP	N/A	N/A	3	3

Daikin Altherma Monobloc Combination Overview		Monobloc Heating Only			Monobloc Heat Pump (Reversible)		
		EDLQ036BA6VJU	EDLQ048BA6VJU	EDLQ054BA6VJU	EBLQ036BA6VJU	EBLQ048BA6VJU	EBLQ054BA6VJU
DHW Tank (50 gal)	EKHWS050BA3VJU	X	X	X	X	X	X
DHW Tank (80 gal)	EKHWS080BA3VJU	X	X	X	X	X	X
Digital I/O PCB	EKRP1HBAAU	1	1	1	1	1	1
Solar Pump Kit	EKSOLHWBAVJU	2	2	2	2	2	2
Wired Thermostat	EKRTWA	X	X	X	X	X	X
Condensate Kit	EKHBDP	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

X - Can be applied

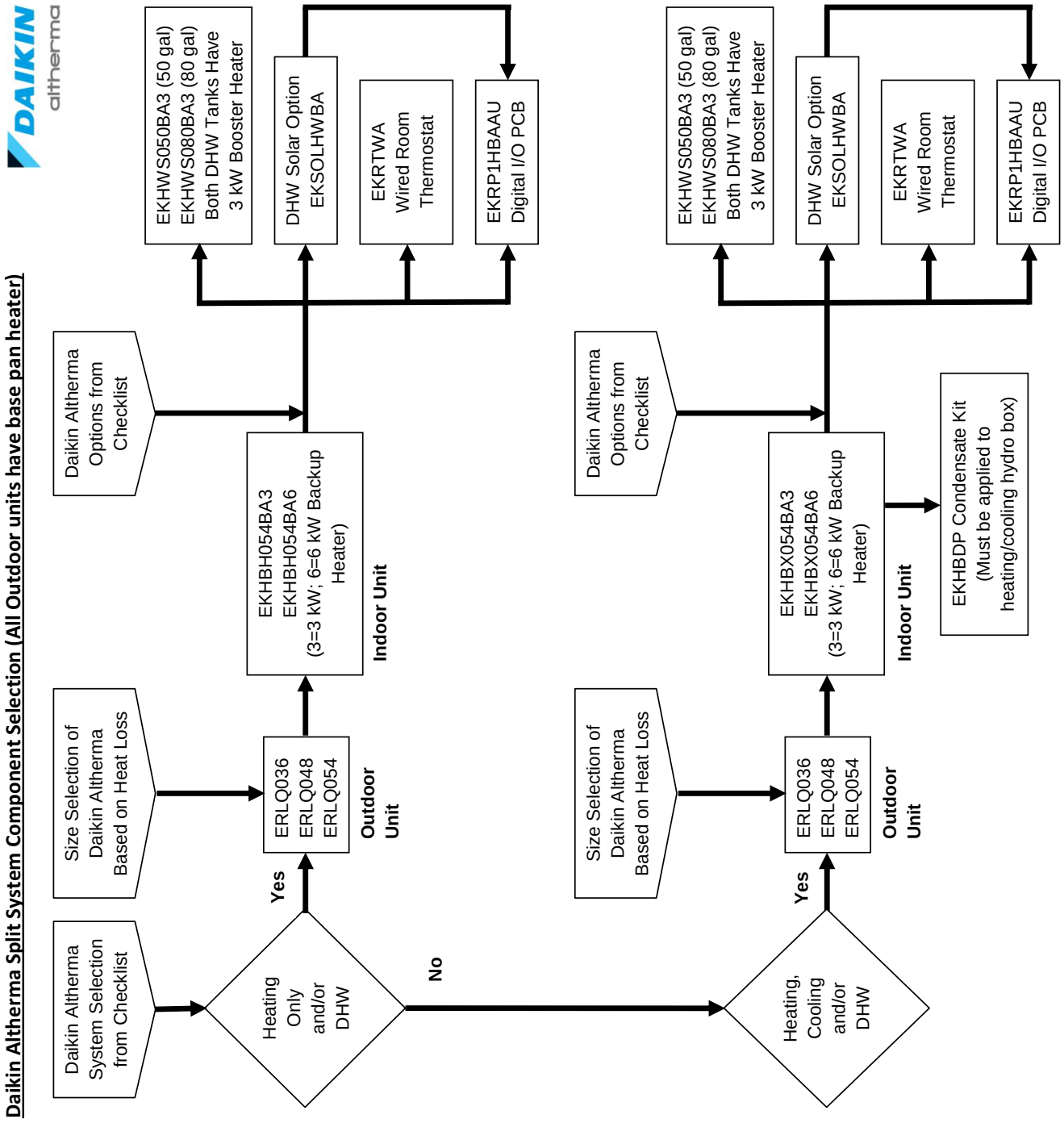
1 - Applied with Solar Pump Kit (DHW solar priority); alarm output; Bi-Valent operation (auxiliary boiler)

2 - Can be applied with DHW Tank (thermal solar panels and pump station to be field supplied)

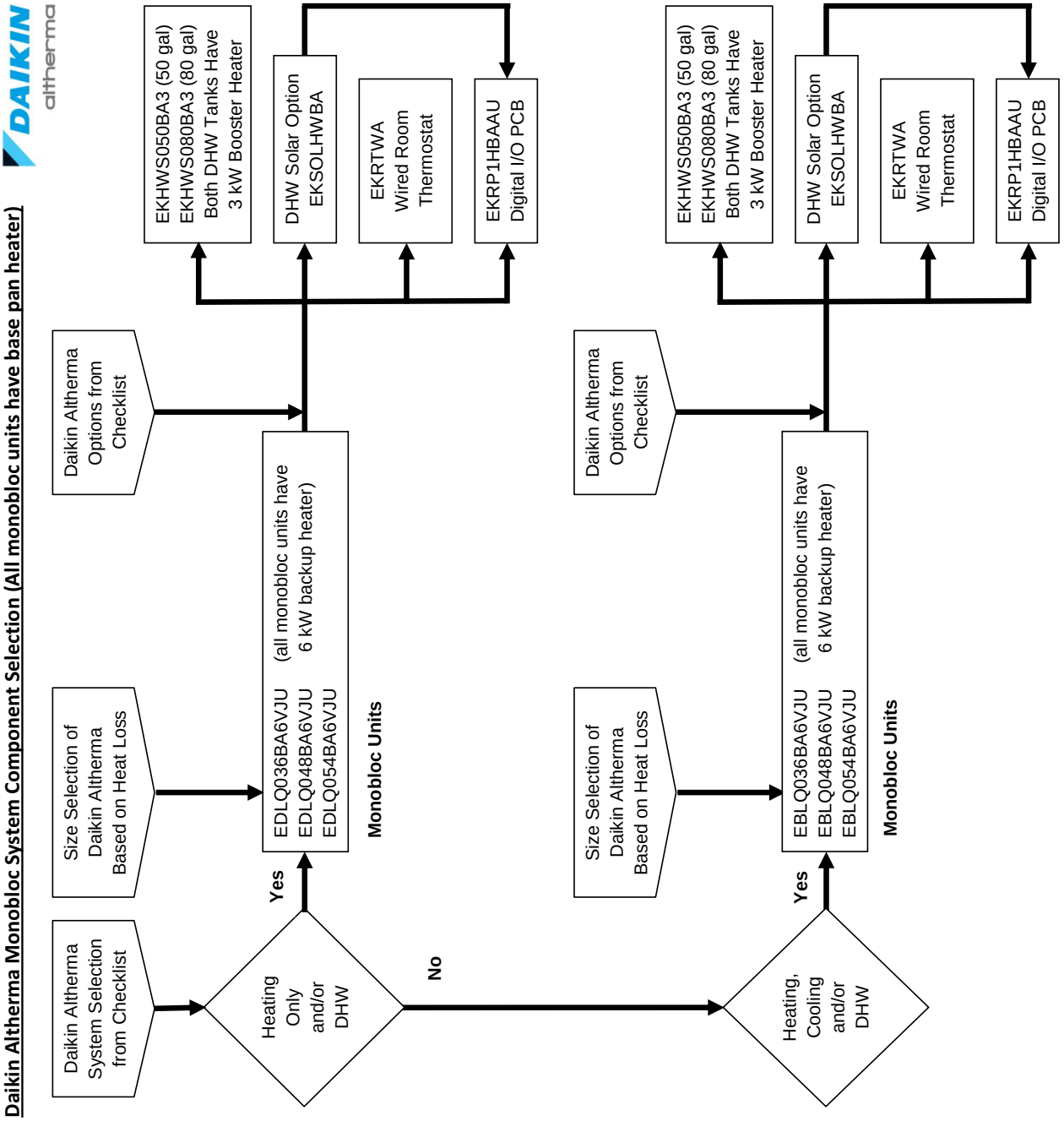
3 - Must be applied with Heat Pump Hydrobox

Combination Overview

6. Split System Component Selection



7. Monobloc Component Selection


Daikin Altherma Monobloc System Component Selection (All monobloc units have base pan heater)
Daikin Altherma System Selection from Checklist
Heating Only and/or DHW
Yes
No
Size Selection of Daikin Altherma Based on Heat Loss
EDLQ036BA6VJU
EDLQ048BA6VJU
EDLQ054BA6VJU
(all monobloc units have 6 kW backup heater)
Monobloc Units
Daikin Altherma Options from Checklist
EKHWS050BA3 (50 gal)
EKHWS080BA3 (80 gal)
Both DHW Tanks Have 3 kW Booster Heater
DHW Solar Option EKSOLHWBA
EKRTWA Wired Room Thermostat
EKRP1HBAAU Digital I/O PCB
Heating, Cooling and/or DHW
Yes
Size Selection of Daikin Altherma Based on Heat Loss
EBLQ036BA6VJU
EBLQ048BA6VJU
EBLQ054BA6VJU
(all monobloc units have 6 kW backup heater)
Monobloc Units
Daikin Altherma Options from Checklist
EKHWS050BA3 (50 gal)
EKHWS080BA3 (80 gal)
Both DHW Tanks Have 3 kW Booster Heater
DHW Solar Option EKSOLHWBA
EKRTWA Wired Room Thermostat
EKRP1HBAAU Digital I/O PCB

1. ERLQ - Split System Outdoor Unit

1.1 Features

- Inverter operated compressor
- Single phase large capacity outdoor unit (036, 048, 054)
- Cost effective alternative to a fossil fuel boiler
- Low energy bills and low CO2 emissions
- Easy to install
- Total solution for year round comfort
- Anti-corrosion treatment on outdoor coil
- Bottom base pan heater to improve water drainage during defrost

ERLQ outdoor units are combined with an indoor hydrobox; a heating-only hydrobox version (EKHBH), and a heat pump (heating & cooling) hydrobox version (EKHBX). Both hydrobox versions can be applied with an optional domestic hot water tank (EKHWS) and optional solar pump kit (EKSOLHW)

2. Specifications - Split System

2-1 NOMINAL CAPACITY AND NOMINAL INPUT				ERLQ036BAVJU	ERLQ048BAVJU	ERLQ054BAVJU
For combination indoor units + outdoor units	Indoor Units			EKHBH054BA (Heating Only)		
Condition (Floor Heating)	Heating capacity	Nominal	kBTU/hr (kW)	38.2 (11.2)	47.8 (14.0)	54.6 (16.0)
	Heating PI	Nominal	kW	2.58	3.30	3.97
	COP	Nominal		4.34	4.24	4.03
Condition 2 (Fan Coil)	Heating capacity	Nominal	kBTU/hr (kW)	35.3 (10.3)	44.8 (13.1)	51.8 (15.2)
	Heating PI	Nominal	kW	3.18	4.00	4.79
	COP	Nominal		3.24	3.28	3.17
For combination indoor units + outdoor units	Indoor Units			EKHBX054BA (Reversible)		
Condition 1 (Floor Heating)	Heating capacity	Nominal	kBTU/hr (kW)	38.2 (11.2)	47.8 (14.0)	54.6 (16.0)
	Cooling capacity	Nominal	kBTU/hr (kW)	47.6 (13.9)	59.1 (17.3)	60.6 (17.8)
	Heating PI	Nominal	kW	2.58	3.30	3.97
	Cooling PI	Nominal	kW	3.91	5.94	6.94
	COP	Nominal		4.34	4.24	4.03
	EER	Nominal		12.17	9.95	8.73
Condition 2 (Fan Coil)	Heating capacity	Nominal	kBTU/hr (kW)	35.3 (10.3)	44.8 (13.1)	51.8 (15.2)
	Cooling capacity	Nominal	kBTU/hr (kW)	34.1 (10.0)	42.7 (12.5)	44.7 (13.1)
	Heating PI	Nominal	kW	3.18	4.00	4.79
	Cooling PI	Nominal	kW	3.72	5.41	6.08
	COP	Nominal		3.24	3.28	3.17
	EER	Nominal		9.17	7.89	7.35
Notes				Condition 1: cooling Ta 95°F (35°C) - LWE 64.4°F (18°C) - heating Ta DB/WB 44.6/42.8°F (7/6°C - LWC 95°F (35°C) (ΔT = 9°F (5°C)		
				Condition 2: cooling Ta 95°F (35°C) - LWE 45°F (7°C) (ΔT = 9°F (5°C) - heating Ta DB/WB 44.6/42.8°F (7/6°C) - LWC 113°F (45°C) (ΔT = 9°F (5°C)		

2-2 TECHNICAL SPECIFICATIONS				ERLQ036BAVJU	ERLQ048BAVJU	ERLQ054BAVJU
Casing	Colour			Ivory white		
	Material			Painted galvanised steel plate		
Dimensions	Unit	Height	in (mm)	46" (1,170 mm)		
		Width	in (mm)	35.4" (900 mm)	35.4" (900 mm)	35.4" (900 mm)
		Depth	in (mm)	12-1/2" (320 mm)	12-1/2" (320 mm)	12-1/2" (320 mm)
	Packing	Height	in (mm)	53" (1,349 mm)		
		Width	in (mm)	38-1/2" (980 mm)	38-1/2" (980 mm)	38-1/2" (980 mm)
		Depth	in (mm)	16-1/2" (420 mm)	16-1/2" (420 mm)	16-1/2" (420 mm)
Weight	Unit		lb (kg)	227 lb (103 kg)	227 lb (103 kg)	227 lb (103 kg)
	Packed Unit		lb (kg)	251.3 lb (114 kg)	251.3 lb (114 kg)	251.3 lb (114 kg)
Packing	Material			EPS		
				Carton		
				Wood		
				PP (Straps)		
	Weight		lb (kg)	24.3 lb (11 kg)	24.3 lb (11 kg)	24.3 lb (11 kg)

2-2 TECHNICAL SPECIFICATIONS				ERLQ036BAVJU	ERLQ048BAVJU	ERLQ054BAVJU
Heat Exchanger	Dimensions	Length	in (mm)	33-3/4" (857 mm)	33-3/4" (857 mm)	33-3/4" (857 mm)
		Nr of Rows		2	2	2
		Fin Pitch	in (mm)	1/16" (1.4 mm)	1/16" (1.4 mm)	1/16" (1.4 mm)
		Nr of Passes		6	6	6
		Face Area	ft² (m²)	3.22 ft² (0.98 m²)	3.22 ft² (0.98 m²)	3.22 ft² (0.98 m²)
		# of Stages		52	52	52
	Tube type			Hi-XSS(8)		
	Fin	Type		WF fin		
		Treatment		Anti-corrosion treatment (PE)		
Fan	Type			Propeller		
	Quantity			2	2	2
Air Flow Rate (nominal at 230V)	Heating	High	cfm (m³/min)	3178 cfm (90 m³/min)	3178 cfm (90 m³/min)	3178 cfm (90 m³/min)
	Cooling	High	cfm (m³/min)	3355 cfm (96 m³/min)	3531 cfm (100 m³/min)	3426 cfm (97 m³/min)
Fan	Discharge direction			Horizontal		
	Motor	Quantity		2	2	2
		Model		Brushless DC motor		
Motor	Speed (nominal)	Steps		8	8	8
		Heating	rpm	760	760	760
		Cooling	rpm	800	850	830
Fan	Motor	Output	W	70 each	70 each	70 each
		Drive		Direct drive		
Compressor	Quantity			1	1	1
	Motor	Model		JT100G-VD		
		Type		Hermetically sealed scroll compressor		
		Motor Output	W	2,200		
		Starting Method		Inverter driven		
Motor	Crankcase Heater	Output	W	33	33	33
Ambient Operation Range	Heating	Min	°F (°C)	-4 (-20)	-4 (-20)	-4 (-20)
		Max	°F (°C)	95 (35)	95 (35)	95 (35)
	Cooling	Min	°F (°C)	50 (10)	50 (10)	50 (10)
		Max	°F (°C)	114.8 (46)	114.8 (46)	114.8 (46)
	Sanitary water	Min	°F (°C)	-4 (-20)	-4 (-20)	-4 (-20)
		Max	°F (°C)	109.4 (43) 95 (35) HP / 109.4 (43) BH	109.4 (43) 95 (35) HP / 109.4 (43) BH)	109.4 (43) 95 (35) HP / 109.4 (43) BH
Sound Level (nominal) *1	Heating	Sound Power	dBA	64	64	66
		Sound Pressure	dBA	49	51	53
	Cooling	Sound Power	dBA	64	66	69
		Sound Pressure	dBA	50	52	54
Sound Level (Night quiet)	Heating	Sound Pressure	dBA	42	42	43
	Cooling	Sound Pressure	dBA	45	45	46
Refrigerant	Type			R-410A		
	Charge		oz (kg)	8.2 lb (3.7 kg)	8.2 lb (3.7 kg)	8.2 lb (3.7 kg)
	Control			Expansion valve(electronic type)		
	Nr of Circuits			1	1	1
Refrigerant Oil	Type			Daphne FVC68D		
	Charged Volume		g (l)	1.06 g (1.0 l)	1.06 g (1.0 l)	1.06 g (1.0 l)

2-2 TECHNICAL SPECIFICATIONS				ERLQ036BAVJU	ERLQ048BAVJU	ERLQ054BAVJU
Piping connections	Liquid (OD)	Quantity		1	1	1
		Type		Flare connection		
		Diameter (OD)	in (mm)	3/8" (9.52 mm)		
	Gas	Quantity		1	1	1
		Type		Flare connection		
		Diameter (OD)	in (mm)	5/8" (15.9 mm)		
	Drain	Quantity		3	3	3
		Type		Hole		
		Diameter (OD)	in (mm)	1-1/32" (26 mm)	1-1/32" (26 mm)	1-1/32" (26 mm)
	Piping Length	Minimum	ft (m)*2	16.4 ft (5 m)	16.4 ft (5 m)	16.4 ft (5 m)
		Maximum	ft (m)	246 ft (75 m)	246 ft (75 m)	246 ft (75 m)
		Equivalent	ft (m)	312 ft (95 m)	312 ft (95 m)	312 ft (95 m)
		Chargeless	ft (m)	98.4 ft (30 m)	98.4 ft (30 m)	98.4 ft (30 m)
	Additional Refrigerant Charge		kg	See installation manual outdoor unit		
	Installation height difference	Maximum	ft (m)	98.4 ft (30 m)	98.4 ft (30 m)	98.4 ft (30 m)
	Heat Insulation			Both liquid and gas pipes		
Defrost Method				Pressure equalizing		
Defrost Control				Sensor for outdoor heat exchanger temperature		
Capacity Control Method				Inverter controlled		
Safety Devices				Fan motor thermal protector		
				Fuse		
				High pressure switch		
Standard Accessories	Item			Tie-wraps		
	Quantity			2	2	2
	Item			Installation manual		
	Quantity			1	1	1
Notes				(*1) The sound pressure level is measured via a microphone at a certain distance from the unit. It is a relative value depending on the distance and acoustic environment. Refer to sound spectrum drawing for more information.		
				(*2) Down to 10 ft. (3 m) with recharging of the outdoor unit. Refer to the installation manual of the outdoor unit.		

2-3 ELECTRICAL SPECIFICATIONS				ERLQ036BAVJU	ERLQ048BAVJU	ERLQ054BAVJU
Power Supply	Name			VJU	VJU	VJU
	Phase			1~	1~	1~
	Frequency		Hz	60	60	60
	Voltage		V	208-230	208-230	208-230
	Voltage range	Minimum	V	-10%	-10%	-10%
		Maximum	V	+10%	+10%	+10%
	Compressor	Rated Load Amps (RLA)	A	23.4	23.4	23.4
		Full Load Amps (FLA)	A	26.5	26.5	26.5
Current	Total	Minimum Current Protection (MCA)	A	26.5	26.5	26.5
		Maximum Current Protection (MOP)	A	30	30	30
Wiring Connections	For Power Supply	Remark		See installation manual outdoor unit		
	For Connection with Indoor	Remark		See installation manual outdoor unit		
Power Supply Intake				Outdoor Unit Only		
Notes				Standard for Safety Heating and Cooling Equipment; UL1995/CSA (U&C) C22.2 #236.		

3. Capacity Tables - Split System

3.1 Heating

MAXIMUM HEATING CAPACITY - PEAK VALUE

MODEL	LWC (°F/°C)	86/30			95/35			104/40			113/45			122/50			131/55		
	T_{amb} (°F/°C)	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	Cop	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP
ERLQ036BAVJU	-4/-20	19.30	7.01	**2.75**	18.70	8.00	**2.34**	15.60	9.42	**1.66**									
	5/-15	22.10	8.02	**2.76**	21.30	8.74	**2.44**	21.10	9.60	**2.20**									
	19/-7.2	27.40	8.09	**3.39**	26.40	8.84	**2.99**	26.00	9.73	**2.67**	25.60	10.77	**2.38**						
	25/-3.9	31.30	8.07	**3.88**	30.20	8.86	**3.41**	29.70	9.78	**3.04**	29.20	10.80	**2.70**	27.90	11.91	**2.34**			
	36/2.2	34.80	8.02	**4.34**	33.50	8.84	**3.79**	33.00	9.77	**3.38**	32.50	10.85	**3.00**	31.10	11.94	**2.60**	29.80	13.26	**2.25**
	45/7.2	39.50	7.95	**4.97**	35.20	8.80	**4.00**	36.70	9.78	**3.75**	35.30	10.84	**3.26**	33.90	12.07	**2.81**	32.50	13.44	**2.42**
	54/12.2	44.80	7.85	**5.71**	43.20	8.70	**4.97**	41.70	9.69	**4.30**	40.10	10.79	**3.72**	38.60	12.04	**3.21**	37.10	13.42	**2.76**
	59/15	48.20	7.77	**6.20**	46.50	8.05	**5.78**	44.90	9.63	**4.66**	43.30	10.74	**4.03**	41.70	12.00	**3.48**	40.10	13.40	**2.99**
	68/20	54.30	7.64	**7.11**	52.50	8.51	**6.17**	50.70	9.49	**5.34**	49.00	10.64	**4.61**	47.20	11.01	**4.29**	45.40	13.33	**3.41**
ERLQ048BAVJU	-4/-20	24.70	9.74	**2.54**	24.40	10.60	**2.30**												
	5/-15	27.00	9.93	**2.72**	27.30	10.82	**2.52**	26.80	11.84	**2.26**									
	19/-7.2	34.30	10.10	**3.40**	33.40	11.03	**3.03**	32.40	12.12	**2.67**	31.60	13.34	**2.37**						
	25/-3.9	39.10	10.20	**3.83**	37.90	11.12	**3.41**	37.70	12.25	**3.08**	36.40	13.16	**2.77**	35.30	14.52	**2.43**			
	36/2.2	43.30	10.20	**4.25**	42.00	11.19	**3.75**	41.70	12.32	**3.38**	40.30	13.24	**3.04**	39.00	14.83	**2.63**	37.80	16.16	**2.34**
	45/7.2	49.20	10.25	**4.80**	47.80	11.25	**4.25**	48.20	12.38	**3.89**	44.80	13.65	**3.28**	43.30	15.09	**2.87**	41.90	16.69	**2.51**
	54/12.2	55.80	10.25	**5.44**	54.10	11.26	**4.80**	52.40	12.40	**4.23**	50.70	13.71	**3.70**	49.10	15.17	**3.24**	47.50	16.78	**2.83**
	59/15	60.10	10.27	**5.85**	58.20	11.27	**5.16**	56.40	12.44	**4.53**	54.70	13.74	**3.98**	52.90	15.20	**3.48**	51.20	16.82	**3.04**
	68/20	67.80	10.30	**6.58**	65.80	11.32	**5.81**	63.80	12.48	**5.11**	61.80	13.79	**4.48**	59.90	15.28	**3.92**	57.90	16.89	**3.43**
ERLQ054BAVJU	-4/-20	28.50	11.53	**2.47**	28.40	12.52	**2.27**												
	5/-15	32.00	11.78	**2.72**	31.80	12.81	**2.48**	31.70	14.00	**2.26**									
	19/-7.2	39.00	12.00	**3.25**	38.40	13.13	**2.92**	37.80	14.40	**2.63**	37.20	15.82	**2.35**						
	25/-3.9	44.40	12.22	**3.63**	43.50	13.31	**3.27**	42.80	14.57	**2.94**	41.70	16.04	**2.60**	40.90	17.67	**2.31**			
	36/2.2	49.10	12.31	**3.99**	48.00	13.43	**3.57**	47.00	14.72	**3.19**	45.90	16.19	**2.84**	44.90	17.84	**2.52**	40.60	18.67	**2.17**
	45/7.2	55.00	12.43	**4.42**	54.60	13.55	**4.03**	53.10	14.87	**3.57**	51.80	16.35	**3.17**	50.50	18.02	**2.80**	45.70	18.85	**2.42**
	54/12.2	63.20	12.57	**5.03**	61.70	13.71	**4.50**	60.10	15.01	**4.00**	58.00	16.51	**3.51**	57.00	18.19	**3.13**	51.60	19.01	**2.71**
	59/15	68.10	12.65	**5.38**	68.40	13.82	**4.95**	64.70	15.12	**4.28**	63.00	16.61	**3.79**	61.30	18.29	**3.35**	55.50	20.12	**2.76**
	68/20	76.00	12.05	**6.31**	75.00	13.99	**5.36**	73.10	15.31	**4.77**	71.10	16.60	**4.28**	69.20	18.48	**3.74**	63.70	20.20	**3.15**

Peak value does not include capacity drop during frosting and defrosting periods.

MAXIMUM HEATING CAPACITY - INTEGRATED VALUE

MODEL	LWC (°F/°C)	86/30			95/35			104/40			113/45			122/50			131/55		
	T_{amb} (°F/°C)	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP
ERLQ036BAVJU	-4/-20	17.20	7.93	**2.17**	16.70	8.01	**2.08**	16.50	9.43	**1.75**									
	5/-15	19.70	8.04	**2.45**	19.00	8.75	**2.17**	18.70	9.62	**1.94**									
	19/-7.2	23.50	8.11	**2.90**	22.00	8.87	**2.48**	22.30	9.76	**2.28**	21.90	10.80	**2.03**						
	25/-3.9	25.40	7.66	**3.32**	24.40	8.41	**2.90**	24.10	9.27	**2.60**	23.70	10.26	**2.31**	22.60	11.28	**2.00**			
	36/2.2	27.80	7.81	**3.56**	26.80	8.60	**3.12**	28.00	9.49	**2.95**	26.00	10.54	**2.47**	24.90	11.80	**2.11**	23.80	12.89	**1.85**
	45/7.2	39.50	7.95	**4.97**	38.20	8.80	**4.34**	38.70	9.76	**3.97**	35.30	10.84	**3.26**	33.90	12.07	**2.81**	32.50	13.44	**2.42**
	54/12.2	44.80	7.85	**5.71**	43.20	8.70	**4.97**	41.70	9.69	**4.30**	40.10	10.79	**3.72**	38.60	12.04	**3.21**	37.10	13.42	**2.76**
	59/15	48.20	7.77	**6.20**	46.50	8.05	**5.78**	44.00	9.63	**4.57**	43.30	10.74	**4.03**	41.70	12.00	**3.48**	40.10	13.40	**2.99**
	68/20	54.30	7.84	**6.93**	52.50	8.51	**6.17**	50.70	9.49	**5.34**	49.00	10.64	**4.61**	47.20	11.91	**3.96**	45.40	13.33	**3.41**
ERLQ048BAVJU	-4/-20	22.00	9.76	**2.25**	21.70	10.62	**2.04**												
	5/-15	24.90	9.95	**2.50**	24.30	10.84	**2.24**	23.80	11.86	**2.01**									
	19/-7.2	27.50	10.13	**2.71**	26.80	11.08	**2.42**	28.00	12.15	**2.30**	25.30	13.37	**1.89**						
	25/-3.9	31.50	9.64	**3.27**	30.70	10.53	**2.92**	30.50	11.55	**2.64**	29.50	12.44	**2.37**	28.60	13.73	**2.08**			
	36/2.2	34.20	9.90	**3.45**	33.10	10.82	**3.06**	32.90	11.92	**2.76**	31.80	12.83	**2.48**	30.50	14.18	**2.15**	29.80	15.67	**1.90**
	45/7.2	49.20	10.25	**4.80**	47.80	11.25	**4.25**	46.20	12.36	**3.74**	44.80	13.65	**3.28**	43.30	15.09	**2.87**	41.90	16.59	**2.53**
	54/12.2	55.80	10.25	**5.44**	54.10	11.26	**4.80**	52.40	12.40	**4.23**	50.70	13.71	**3.70**	49.10	15.17	**3.24**	47.50	16.78	**2.83**
	59/15	60.10	10.27	**5.85**	58.20	11.27	**5.16**	56.40	12.44	**4.53**	54.70	13.74	**3.98**	52.90	15.20	**3.48**	51.20	16.82	**3.04**
	68/20	67.80	10.30	**6.58**	65.80	11.32	**5.81**	63.80	12.48	**5.11**	61.80	13.79	**4.48**	59.90	15.28	**3.92**	57.90	16.89	**3.43**
ERLQ054BAVJU	-4/-20	25.40	11.55	**2.20**	25.20	12.54	**2.01**												
	5/-15	28.50	11.80	**2.42**	28.30	12.02	**2.35**	28.20	14.02	**2.01**									
	19/-7.2	30.40	11.82	**2.57**	29.90	12.05	**2.48**	29.40	14.08	**2.09**	29.00	15.48	**1.87**						
	25/-3.9	35.90	11.53	**3.11**	35.20	12.56	**2.80**	34.50	13.76	**2.51**	33.80	15.14	**2.23**	33.10	16.08	**2.06**			
	36/2.2	37.90	11.16	**3.40**	37.10	12.18	**3.05**	38.30	13.34	**2.87**	35.50	14.88	**2.39**	34.70	16.16	**2.15**	31.40	16.05	**1.96**
	45/7.2	55.80	12.43	**4.49**	54.50	13.55	**4.02**	53.10	14.87	**3.57**	51.80	16.35	**3.17**	50.50	18.02	**2.80**	45.70	18.85	**2.42**
	54/12.2	63.20	12.57	**5.03**	61.70	13.71	**4.50**	60.10	15.01	**4.00**	58.60	16.51	**3.55**	57.00	18.19	**3.13**	51.80	19.01	**2.72**
	59/15	68.10	12.58	**5.41**	68.40	13.82	**4.95**	64.70	15.12	**4.28**	63.00	16.61	**3.79**	61.30	18.29	**3.35**	56.50	20.12	**2.81**
	68/20	78.90	12.65	**6.24**	75.00	13.99	**5.36**	73.10	15.31	**4.77**	71.10	18.80	**3.78**	69.20	18.48	**3.74**	63.70	20.28	**3.14**

Integrated value takes into consideration the capacity drop during frosting and defrosting periods.

3.2 Cooling

MAXIMUM COOLING CAPACITY

MODEL	T_{amb} (°F/°C)	60/15.6			77/25			86/30			95/35			104/40			113/45		
	LWE (°F/°C)	CC kBTU/h	PI (kW)	EER	CC kBTU/h	PI (kW)	EER	CC kBTU/h	PI (kW)	EER	CC kBTU/h	PI (kW)	EER	CC kBTU/h	PI (kW)	EER	CC kBTU/h	PI (kW)	
ERLQ036BAVJU	45/7.2	39.90	2.68	**14.89**	38.10	2.98	**12.79**	36.10	3.33	**10.84**	34.10	3.72	**9.17**	32.00	4.15	**7.71**	29.90	4.63	**6.46**
	50/10	43.90	2.70	**16.26**	41.90	3.01	**13.92**	39.70	3.37	**11.78**	37.00	3.77	**9.81**	35.30	4.21	**8.38**	32.90	4.70	**7.00**
	55/12.8	48.00	2.72	**17.65**	45.80	3.04	**15.07**	43.50	3.41	**12.76**	41.20	3.82	**10.79**	38.70	4.27	**9.06**	36.20	4.77	**7.59**
	59/15	50.90	2.73	**18.64**	48.60	3.06	**15.88**	46.20	3.44	**13.43**	43.70	3.85	**11.35**	41.10	4.32	**9.51**	36.50	4.82	**7.57**
	64/17.8	55.30	2.75	**20.11**	52.80	3.10	**17.03**	50.20	3.48	**14.43**	47.60	3.91	**12.17**	44.80	4.36	**10.28**	42.00	4.90	**8.57**
	72/22.2	61.50	2.79	**22.04**	55.70	3.15	**17.68**	55.00	3.55	**15.49**	53.00	3.99	**13.28**	50.00	4.48	**11.16**	45.40	4.08	**11.13**
ERLQ048BAVJU	45/7.2	49.60	3.98	**12.46**	47.50	4.40	**10.80**	45.20	4.87	**9.28**	42.70	5.41	**7.89**	39.90	6.02	**6.63**	37.80	6.04	**6.26**
	50/10	54.60	4.08	**13.38**	52.30	4.50	**11.62**	49.70	4.99	**9.96**	45.00	5.54	**8.12**	43.90	6.16	**7.13**	38.20	5.58	**6.85**
	55/12.8	59.90	4.18	**14.33**	57.20	4.82	**11.87**	54.40	5.12	**10.63**	51.30	5.65	**9.08**	48.00	6.31	**7.61**	40.70	5.16	**7.89**
	59/15	63.50	4.25	**14.94**	60.70	4.70	**12.91**	57.60	5.21	**11.06**	54.40	5.78	**9.41**	50.90	6.41	**7.94**	41.60	4.91	**8.47**
	64/17.8	69.10	4.37	**15.81**	65.90	4.83	**13.64**	62.60	5.38	**11.64**	59.10	5.94	**9.95**	55.40	6.58	**8.42**	44.00	4.54	**9.69**
	72/22.2	70.80	4.58	**15.46**	73.30	5.03	**14.57**	69.60	5.57	**12.50**	65.70	6.18	**10.63**	58.10	5.49	**10.58**	45.40	4.08	**11.13**
ERLQ054BAVJU	45/7.2	52.30	4.50	**11.62**	50.10	4.97	**10.08**	47.60	5.60	**8.50**	44.70	6.08	**7.35**	41.50	6.71	**6.18**	37.60	6.04	**6.23**
	50/10	57.70	4.63	**12.46**	55.10	5.11	**10.78**	52.20	5.65	**9.24**	49.00	6.23	**7.87**	45.50	6.87	**6.62**	38.20	5.58	**6.85**
	55/12.8	63.20	4.77	**13.25**	60.30	5.27	**11.44**	57.10	5.81	**9.83**	53.60	6.41	**8.36**	49.80	7.06	**7.05**	40.70	5.16	**7.89**
	59/15	67.00	4.87	**13.76**	63.90	5.37	**11.90**	60.50	5.92	**10.22**	55.60	6.52	**8.53**	52.70	7.18	**7.34**	41.80	4.91	**8.51**
	64/17.8	71.70	5.19	**13.82**	68.30	5.72	**11.94**	64.60	6.30	**10.25**	60.60	6.94	**8.73**	56.00	6.83	**8.20**	44.00	4.54	**9.69**
	72/22.2	79.70	5.50	**14.49**	75.80	6.05	**12.53**	71.70	6.65	**10.78**	67.30	7.30	**9.22**	58.10	5.49	**10.58**	45.40	4.06	**11.18**

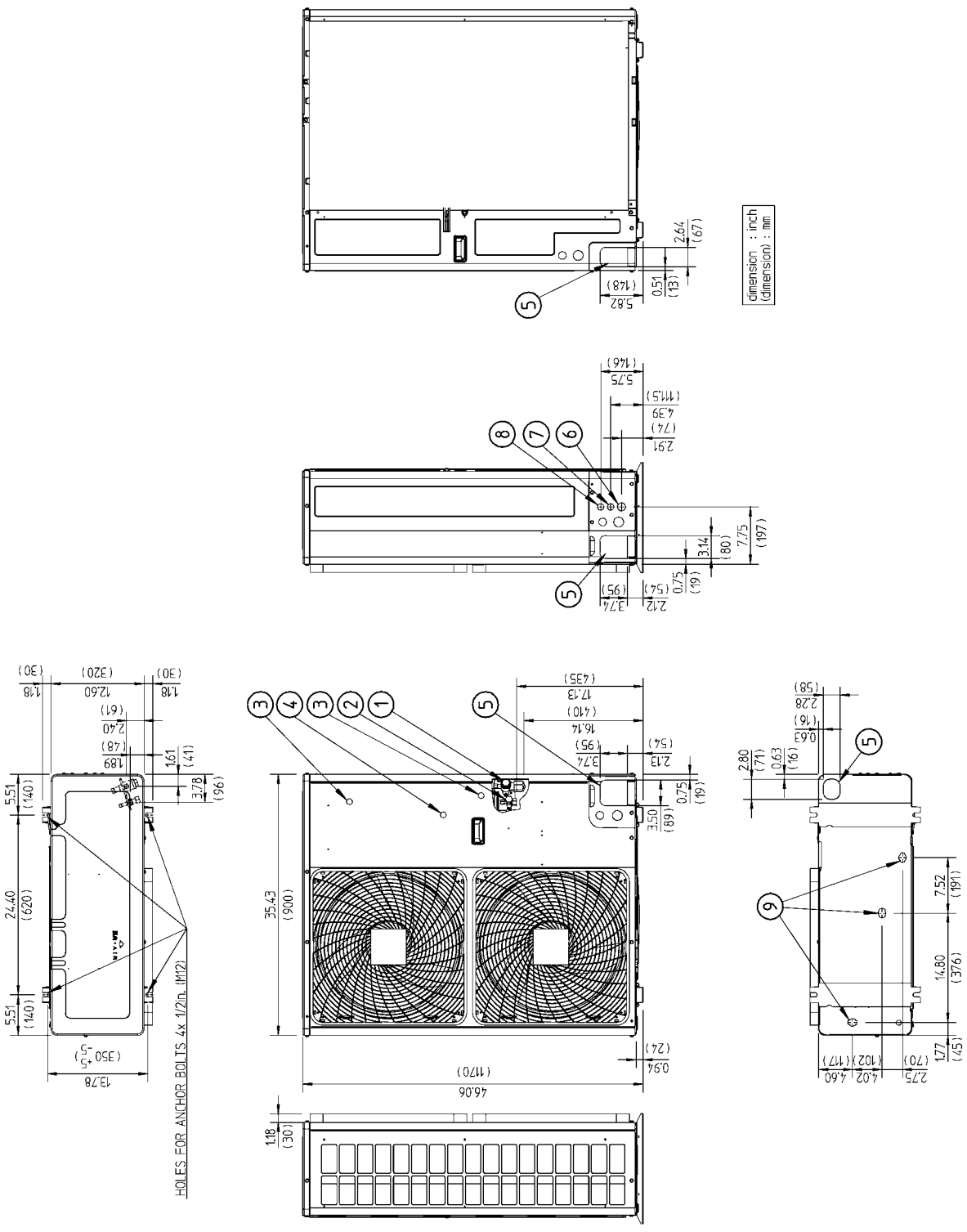
Symbols:

CC Cooling Capacity @ maximum operating frequency, BTU/h
HC Heating Capacity @ maximum operating frequency, BTU/h
PI Cooling Power Input (kW), Heating Power Input (kBTU/h measured according to Eurovent 6/C003-2006 (kW)/EN14511
LWE Leaving Water evaporator temperature (Cooling)
LWC Leaving Water condenser temperature (Heating)
Tamb Outdoor Ambient temperature, RH = 85%

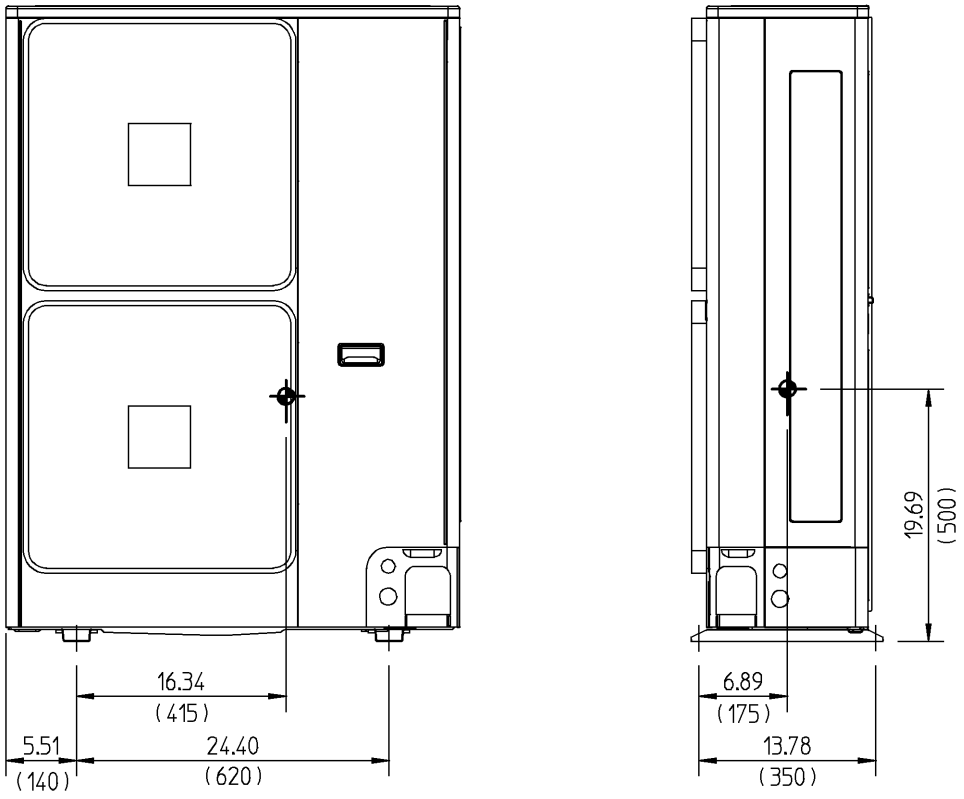
Conditions:

Cooling Capacity BTU/h and valid for chilled water range ΔT = 5-15^{0}F (3-8^{0}C)
Heating Capacity is according to Eurovent 6/C/003-2006 (kW) and valid for heating water range ΔT = 5-15^{0}F (3-8^{0}C)
Power Input is total of indoor and outdoor unit, except the circulation pump; (90W per EN14511)

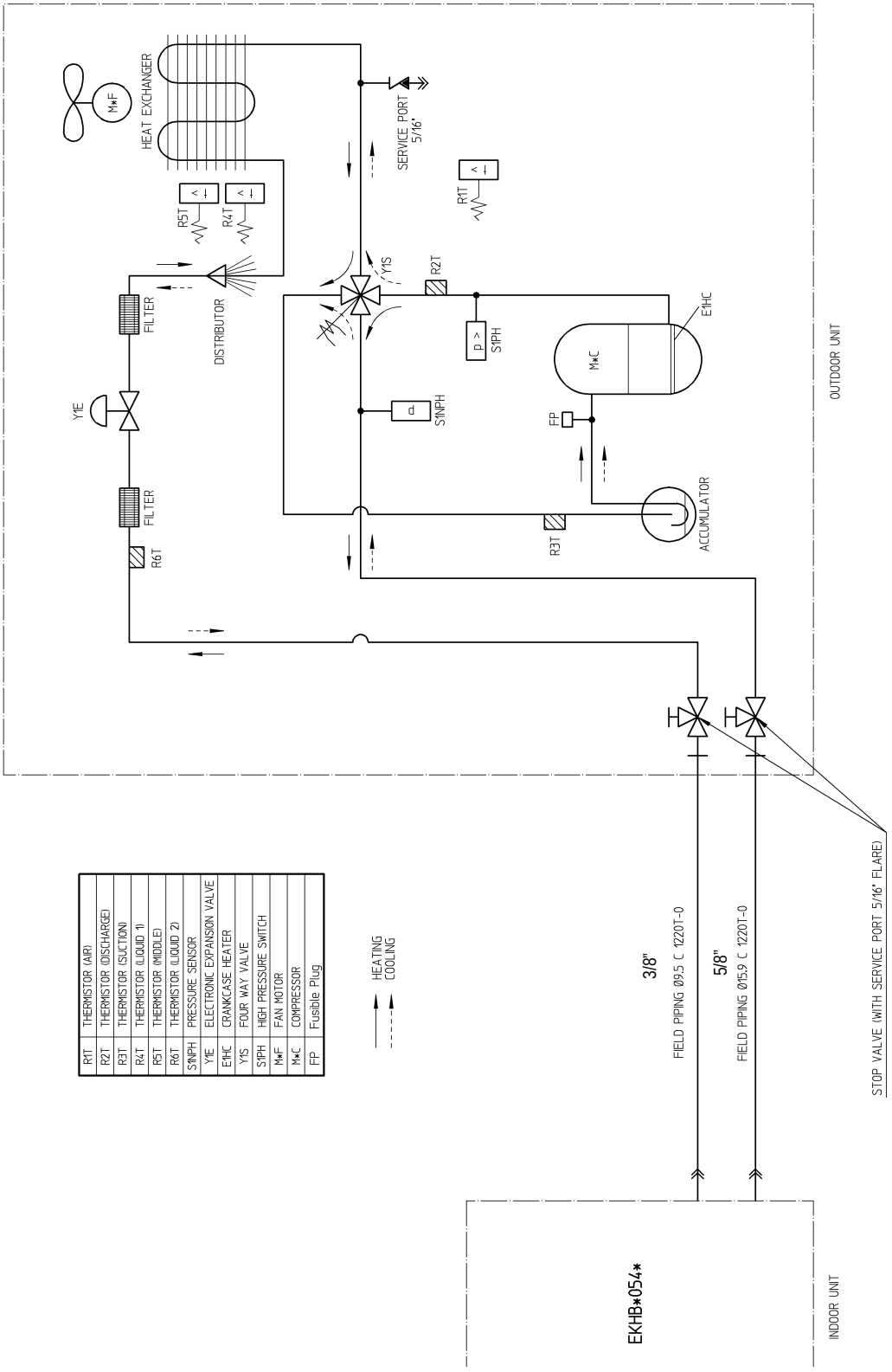
4. Dimensional Drawing - Split System



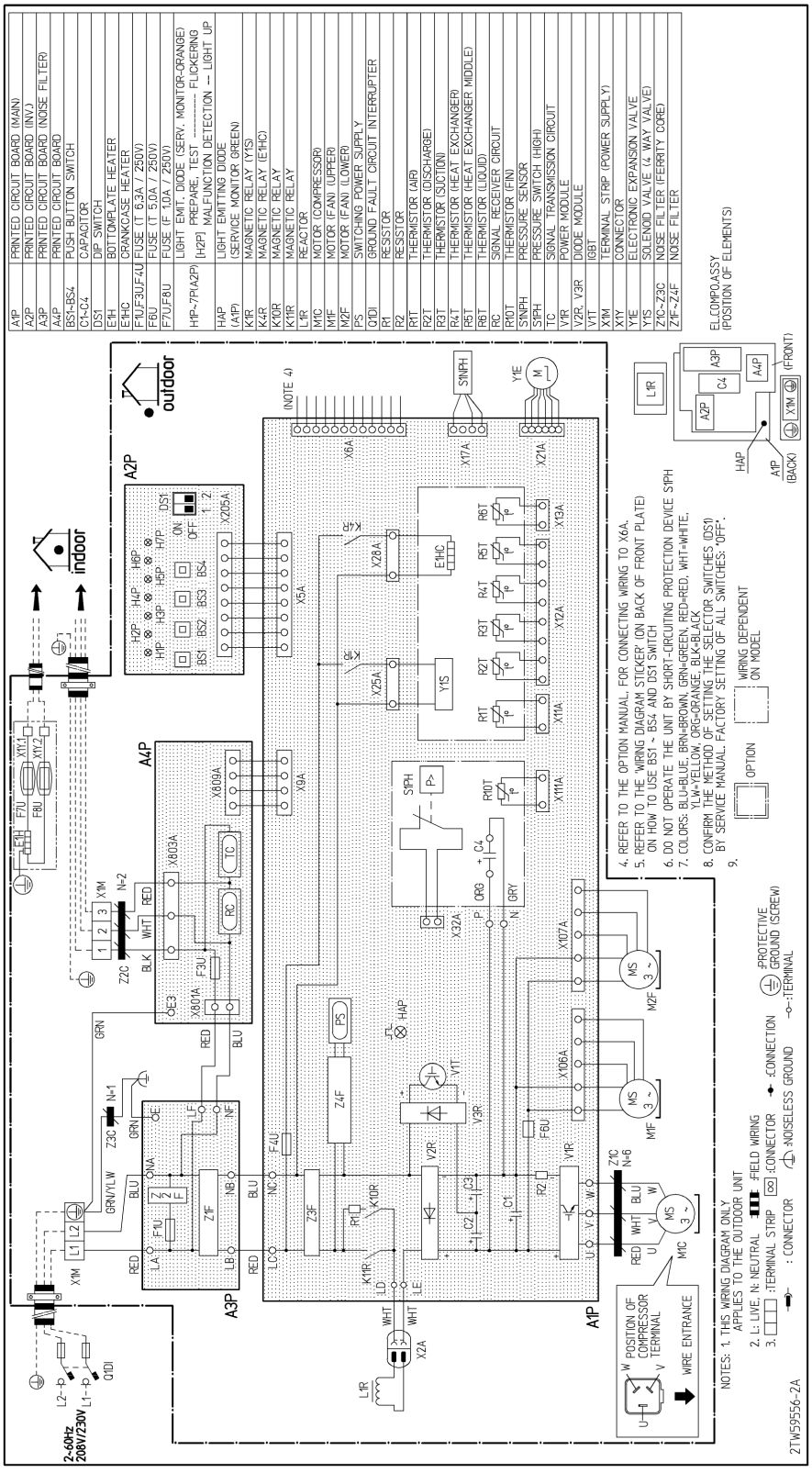
5. Center of Gravity - Split System



6. Piping Diagram - Split System

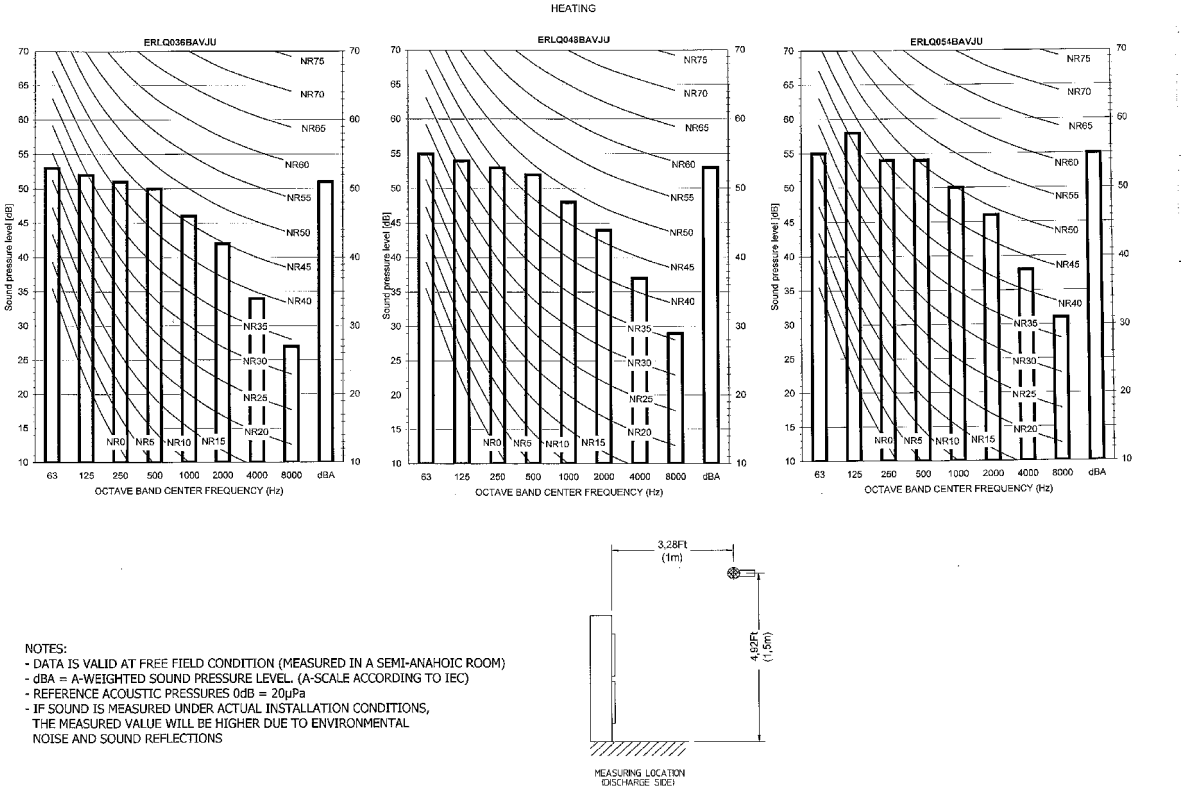


7. Wiring Diagram - Split Sytem


A1P PRINTED CIRCUIT BOARD (MAIN)
A2P PRINTED CIRCUIT BOARD (INV.)
A3P PRINTED CIRCUIT BOARD (NOISE FILTER)
A4P PRINTED CIRCUIT BOARD
BS1~BS4 PUSH BUTTON SWITCH
C1~C4 CAPACITOR
DS1 DIP SWITCH
E1H BOTTOMPLATE HEATER
E1HC CRANKCASE HEATER
F1U,F3U,F4U FUSE (T 6.3A / 250V)
F6U FUSE (T 5.0A / 250V)
F7U,F8U FUSE (F 1.0A / 250V)
H1P~7P,H2P LIGHT EMIT. DIODE (SERV. MONITOR-ORANGE)
PREPARE TEST ---------- FLICKERING
[H2P] MALFUNCTION DETECTION -- LIGHT UP
H4P LIGHT EMITTING DIODE
(H1P) (SERVICE MONITOR-GREEN)
K1R MAGNETIC RELAY (Y/S)
K2R MAGNETIC RELAY (E1HC)
K10R MAGNETIC RELAY
K11R MAGNETIC RELAY
L1R REACTOR
M1C MOTOR (COMPRESSOR)
M1F MOTOR (FAN) (UPPER)
M2F MOTOR (FAN) (LOWER)
PS SWITCHING POWER SUPPLY
Q1DI GROUND FAULT CIRCUIT INTERRUPTER
R1 RESISTOR
R2 RESISTOR
R1T THERMISTOR (AIR)
R2T THERMISTOR (SUCTION)
R3T THERMISTOR (HEAT EXCHANGER)
R4T THERMISTOR (HEAT EXCHANGER MIDDLE)
R5T THERMISTOR (LIQUID)
R6T THERMISTOR (LIQUID)
RC SIGNAL RECEIVER CIRCUIT
R10T THERMISTOR (FIN)
S1NPH PRESSURE SENSOR
S1PH PRESSURE SWITCH (HIGH)
TC SIGNAL TRANSMISSION CIRCUIT
V1R POWER MODULE
V2R, V3R DIODE MODULE
V1T IGBT
X1M TERMINAL STRIP (POWER SUPPLY)
X1Y CONNECTOR
Y1E ELECTRONIC EXPANSION VALVE
Y1S SOLENOID VALVE (4 WAY VALVE)
Z1C~Z3C NOISE FILTER (FERRITY CORE)
Z1F~Z4F NOISE FILTER
ELCOMPO.ASSY (POSITION OF ELEMENTS)
outdoor
indoor
A1P
A2P
A3P
A4P
NOTES: 1. THIS WIRING DIAGRAM ONLY APPLIES TO THE OUTDOOR UNIT
2. L: LIVE, N: NEUTRAL :FIELD WIRING
3. :TERMINAL STRIP :CONNECTOR
: CONNECTOR :NOISELESS GROUND
4. REFER TO THE OPTION MANUAL FOR CONNECTING WIRING TO X6A.
5. REFER TO THE 'WIRING DIAGRAM STICKER' (ON BACK OF FRONT PLATE) ON HOW TO USE BS1 ~ BS4 AND DS1 SWITCH
6. DO NOT OPERATE THE UNIT BY SHORT-CIRCUITING PROTECTION DEVICE S1PH
7. COLORS: BLU=BLUE, BRN=BROWN, GRN=GREEN, RED=RED, WHT=WHITE, YLW=YELLOW, ORG=ORANGE, BLK=BLACK
8. CONFIRM THE METHOD OF SETTING THE SELECTOR SWITCHES (DS1) BY SERVICE MANUAL. FACTORY SETTING OF ALL SWITCHES: "OFF".
9. OPTION WIRING DEPENDENT ON MODEL
POSITION OF COMPRESSOR TERMINAL
WIRE ENTRANCE
PROTECTIVE GROUND (SCREW)
TERMINAL
2~60Hz 208V/230V
ZTW59556-2A

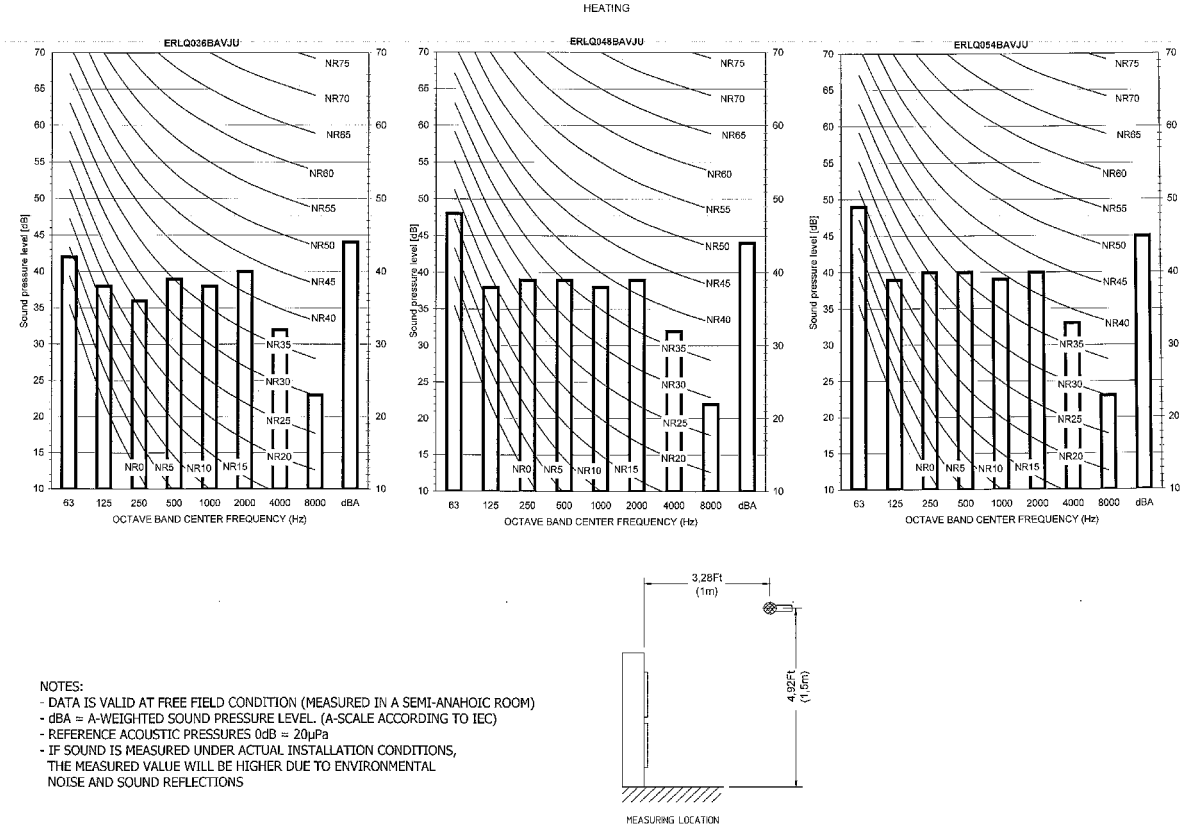
8. Sound Data - Split System

Normal Operation:



NOTES:
- DATA IS VALID AT FREE FIELD CONDITION (MEASURED IN A SEMI-ANAHOIC ROOM)
- dBA = A-WEIGHTED SOUND PRESSURE LEVEL. (A-SCALE ACCORDING TO IEC)
- REFERENCE ACOUSTIC PRESSURES 0dB = 20μPa
- IF SOUND IS MEASURED UNDER ACTUAL INSTALLATION CONDITIONS, THE MEASURED VALUE WILL BE HIGHER DUE TO ENVIRONMENTAL NOISE AND SOUND REFLECTIONS

Night Quiet Operation:



NOTES:
- DATA IS VALID AT FREE FIELD CONDITION (MEASURED IN A SEMI-ANAHOIC ROOM)
- dBA = A-WEIGHTED SOUND PRESSURE LEVEL. (A-SCALE ACCORDING TO IEC)
- REFERENCE ACOUSTIC PRESSURES 0dB = 20μPa
- IF SOUND IS MEASURED UNDER ACTUAL INSTALLATION CONDITIONS, THE MEASURED VALUE WILL BE HIGHER DUE TO ENVIRONMENTAL NOISE AND SOUND REFLECTIONS

9. Installation - Split System

9.1 Installation Location

- The equipment is not is not intended for use in a potentially explosive atmosphere.
- Choose a place solid enough to bear the weight and vibration of the unit, where operation sounds will not be amplified.
- Locate the unit so that operation sounds and discharged hot/cold air will not bother neighbors.
- Avoid places such as bedrooms so that operation sounds are not a problem.
- Allow sufficient space for carrying the unit into and out of the site.
- Ensure there is sufficient space for air passage and a lack of obstructions around the air inlet and the air outlet.
- The site must be free from the possibility of flammable gas leakage in any nearby area.
- Install units, power cable, and inter-unit cables at least 10 feet (3 m) away from televisions and radios to prevent interference.
- Depending on radio wave conditions, electromagnetic interference may still occur even if installed more than 10 ft. (3 m) away.
- In coastal areas or other places with salty atmosphere of sulfate gas, corrosion my shorten the life of the outdoor unit.
- Since condensate flows out of the outdoor unit, do not place anything under the unit that must be kept from moisture.

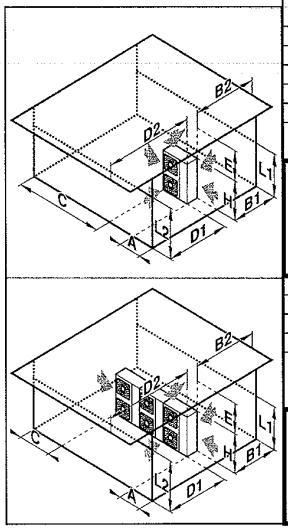
IN COLD CLIMATES:

- To prevent exposure to wind, install the outdoor unit with its suction side facing the wall.
- Never install the outdoor unit at a site where the suction side may be exposed directly to wind.
- To prevent exposure to wind, install a baffle plate on the air discharge side of the outdoor unit.
- Unit should be installed with a minimum of 4” (10 cm) free space below the unit’s bottom plate at all condition, e.g., heavy snowfall (construct a pedestal if necessary).
- In heavy snowfall areas, it is very important to select an installation site where the snow will not affect the unit. If lateral snowfall is possible, make sure the heat exchanger coil is not affected by the snow (construct a lateral canopy if necessary). See Figure 1:

Figure 1: construction of canopy and pedestal

9.2 Installation Space

A. NON STACKED INSTALLATION



↙	↗	↘	↖	↓			A	B1	B2	C	D1	D2	E	L1/L2	
✓								≥4 [100]							
✓		✓	✓				≥4[100]	≥4 [100]		≥4 [100]					
✓				✓				≥4 [100]				≤20 [500]	≥40 [1000]		
✓		✓	✓	✓			≥6[150]	≥6 [150]		≥6 [150]		≤20 [500]	≥40 [1000]		
	✓										≥20 [500]				
	✓			✓					≤20[500]		≥20 [500]		≥40 [1000]		
✓	✓				L1<L2			≥4 [100]			≥20 [500]				
					L2<L1			≥4 [100]			≥20 [500]				
✓	✓			✓	L1<L2	L1≤H		≥10 [250]	≤20 [500]		≥30 [750]		≥40 [1000]	0<L1≤1/2H	1
											≥40 [1000]			0<L1≤1/2H	
						H<L1					L1≤H				
					L2<L1	L2≤H		≥4 [100]			≥40 [1000]	≥20 [500]	≥40 [1000]	0<L2≤1/2H	
								≥8 [200]						1/2H<L2≤H	
						H<L2					L2≤H				
✓		✓	✓				≥8 [200]	≥12 [300]		≥40 [1000]					
✓		✓	✓	✓			≥8 [200]	≥12 [300]		≥40 [1000]		≤20[500]	≥40 [1000]		
	✓										≥40 [1000]				
	✓			✓					≤20[500]		≥40 [1000]		≥40 [1000]		
✓	✓				L1<L2			≥12 [300]			≥40 [1000]				
					L2<L1			≥10 [250]			≥60 [1500]			0<L2≤1/2H	
								≥12 [300]						1/2H<L2≤H	
✓	✓			✓	L1<L2	L1≤H		≥12 [300]	≤20 [500]		≥40 [1000]		≥40 [1000]	0<L1≤1/2H	1
											≥50 [1250]			1/2H<L1≤H	
						H<L1					L1≤H				
					L2<L1	L2≤H		≥10 [250]			≥60 [1500]	≤20 [500]	≥40 [1000]	0<L2≤1/2H	2
								≥12 [300]						1/2H<L2≤H	
						H<L2					L2≤H				

LEGEND (Unit: Inch [mm])

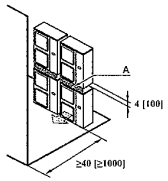
- ↙ Suction side obstacle
- ↗ Discharge side obstacle
- ↘ Left side obstacle
- ↖ Right side obstacle
- ↓ Top side obstacle
- ✓ Obstacle is present
- This situation is not allowed

1 In these cases, close bottom of the installation frame to prevent discharged air from being bypassed

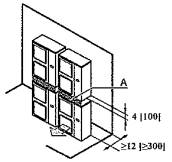
2 In these cases, only 2 units can be installed

B. STACKED INSTALLATION

1. OBSTACLES EXIST IN FRONT OF THE OUTLET SIDE



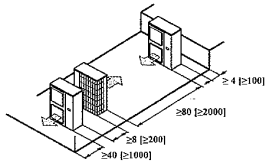
2. OBSTACLES EXIST IN FRONT OF THE AIR INLET



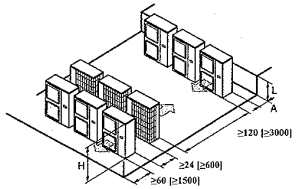
Do not stack more than one unit.
About 4 in. (100mm) is required as the dimension for laying the upper outdoor unit's drain pipe.
Get the portion A sealed so that air from the outlet does not bypass.

C. MULTIPLE-ROW INSTALLATION

1. INSTALLATION OF ONE UNIT PER ROW



2. INSTALLING MULTIPLE UNITS (2 units or more) IN LATERAL CONNECTION PER ROW

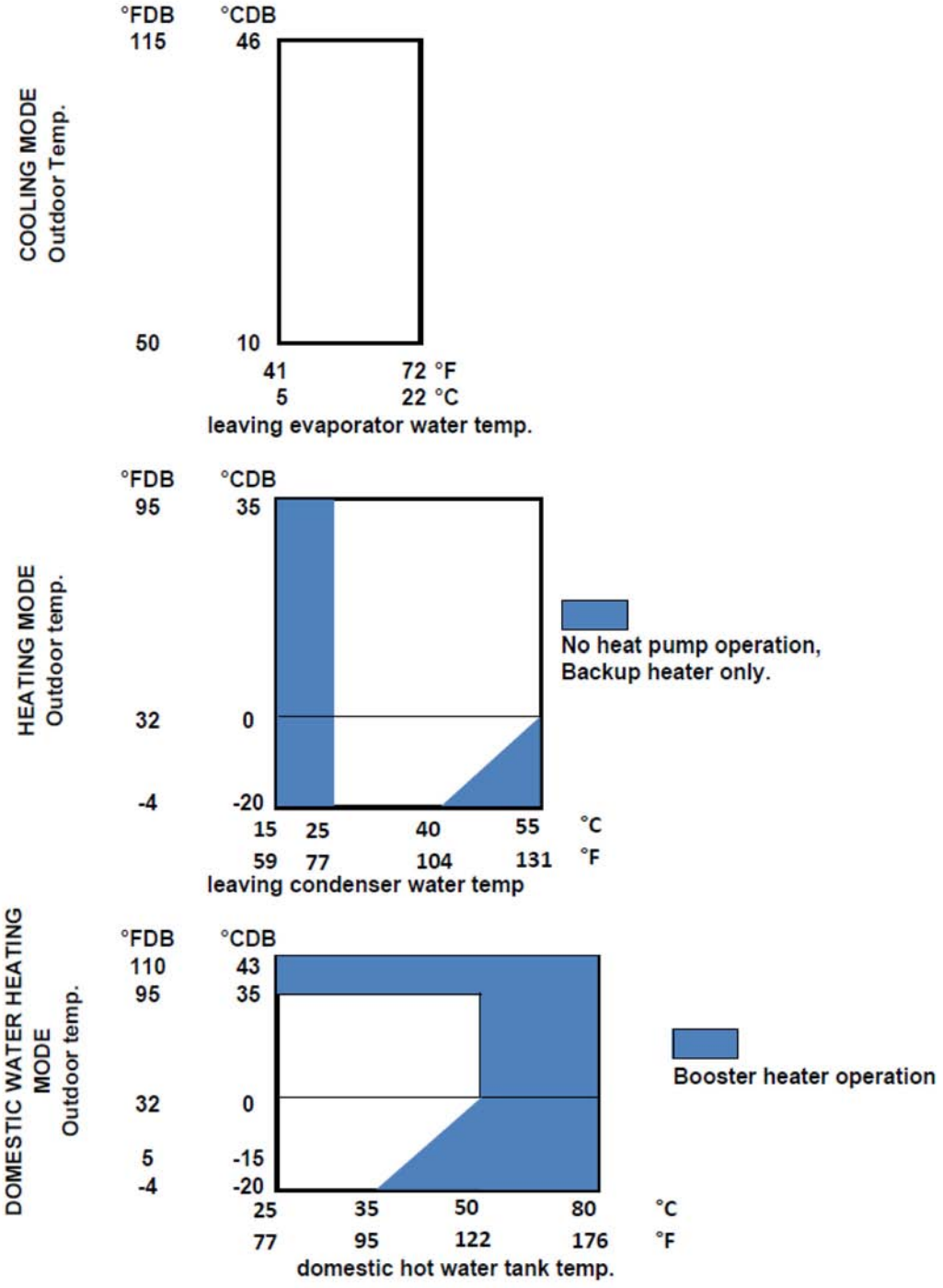


Relation of dimensions of H, A and L are shown in the table below.

	L	A
L ≤ H	0<L≤1/2H	10 [250]
	1/2H < L	12 [300]
H < L	Installation not allowed	

Installation - Split System

10. Operation Range - Split System



1. EKHBH054BA - Hydrobox

1.1 Features

- Heating only - **EKHBH054BA**
- Heat Pump (heating & cooling) - **EKHBX054BA**
- Large capacity indoor unit
- Cost effective alternative to a fossil fuel boiler
- Low energy bills and low CO_2 emissions
- Interface control with field selectable options that include dual set point (heating & cooling), Quiet Mode, DHW priority settings, schedule timer.
- Easy to install
- Total solution for year round comfort
- Apply with split system outdoor unit (ERLQ)
- Select from 2 sizes of integrated backup heat 3kW (single stage) or 6 kW (2-stage)

The hydrobox is the indoor part of the air-to-water ERLQ outdoor heat pump. These units are designed for wall-mounted indoor installation. The units can be combined with fan coil units, floor heating applications, low temperature radiators, optional Daikin Domestic Hot Water Tanks, and optional Daikin Solar Kits for domestic hot water applications.

The unit range consists of two main versions: a heating/cooling version (EKHBX) and a heating-only version (EKHBH). Both versions are delivered with an integrated backup heater for additional heating during cold outdoor temperatures. The backup heater also serves as a backup if malfunctioning of the outdoor unit should occur. The backup heater models are available for a heating capacity of 3kW and 6kW.

2. Specifications - Hydrobox

2-1 TECHNICAL SPECIFICATIONS

					EKHBH*			EKHBX*			
					EKHBH054BA*			EKHBX054BA*			
Outdoor units					ERLQ036BAVJU	ERLQ048BAVJU	ERLQ054BAVJU	ERLQ036BAVJU	ERLQ048BAVJU	ERLQ054BAVJU
Nominal input (Indoor only without electric heater)					208-230V / 1 ph / 60Hz					
Casing		Color			Neutral White RAL9010					
		Material			Epoxy polyester painted galvanized steel					
Dimensions	Packing	Height		in (mm)	49.23 (1225)					
		Width		in (mm)	25.98 (660)					
		Depth		in (mm)	24.02 (610)					
	Unit	Height		in (mm)	36.30 (922)					
		Width		in (mm)	19.76 (502)					
		Depth		in (mm)	14.21 (361)					
Weight of unit	Machine net weight			lbs (kg)	123 (55)					
	Packed machine weight			lbs (kg)	152 (69)					
Weight of packing materials	Material				EPS, Wood, Carton, PP (straps)					
	Weight			lbs (kg)	29 (14)					
Main Components	Pump	Type			water cooled					
		no. of speeds			3					
		Nominal ESP unit	Cooling	psi (kPa)	–	–	–	8.04 (55.4)	6.53 (45.0)	6.13 (42.3)
			Heating	psi (kPa)	7.34 (50.7)	5.48 (37.8)	3.92 (27.1)	7.34 (50.7)	5.48 (37.8)	3.92 (27.1)
		Power Input		W	210					
	Water Side Heat Exchanger	Type			Brazed Plate					
		Quantity			1					
		Water volume		gal/m (l/min)	0.27 (1.01)					
		Water flow rate Min.		gal/m (l/min)	4.23 (16)					
		Water flow rate Nom.	Cooling (2)	gal/m (l/min)	–	–	–	7.58 (28.7)	9.45 (35.8)	9.90 (37.5)
			Heating (3)	gal/m (l/min)	8.47 (32.1)	10.59 (40.1)	12.12 (45.9)	8.47 (32.1)	10.59 (40.1)	12.12 (45.9)
		Water flow rate Max.	Cooling	gal/min (l/min)	15.3 (58)					
			Heating	gal/min (l/min)	15.3 (58)					
		Insulation material			Polyurethane foam					
	Expansion vessel	Volume		gal/min (l/min	2.64 (10)					
		Max. water pressure		psi (bar	43.5 (3)					
		Pre pressure		psi (bar)	14.3 (1)					
	Water Filter	Diameter perforations		inch (mm)	0.039 (1)					
		Material			brass					

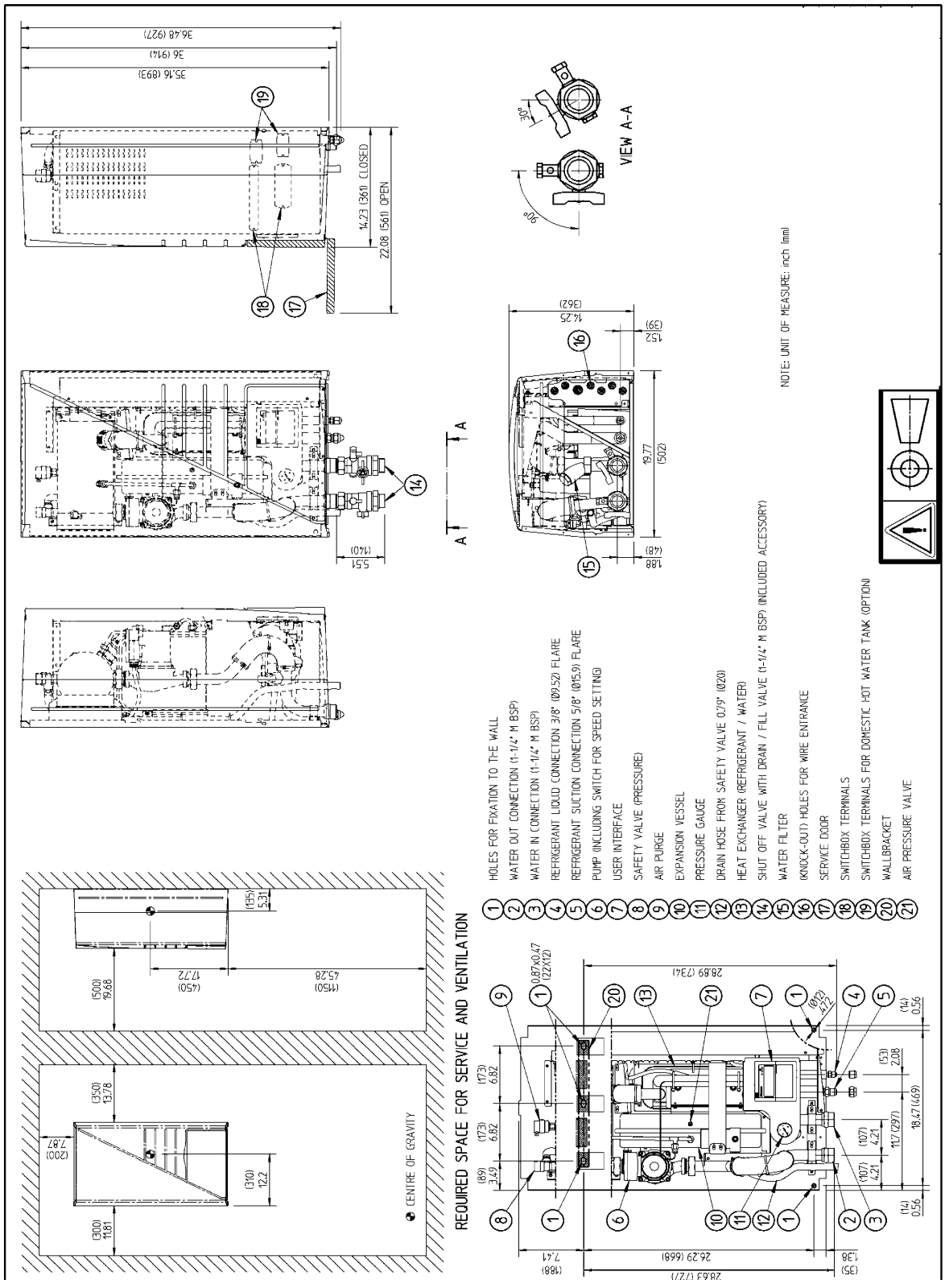
2-1 TECHNICAL SPECIFICATIONS

Water Circuit	Piping Connections			G 1-1/4 (MALE) BSP	
	Piping		in (mm)	1-1/4 (31.8) BSP	
	Safety valve		psi (bar)	43.5 (3)	
	Manometer			Yes	
	Drain valve / Fill valve			Yes	
	Shut-off valve			Yes	
	Air Purge valve			Yes	
	Total water volume (6)		gal (l)	1.45 (5.5)	
Refrig. Circuit	Gas side		in (mm)	5/8 (15.9)	
	Liquid side		in (mm)	3/8 (9.52)	
Sound Level	Sound Pressure (4)	Heating	dBA	28	
	Sound power		dBA	–	
Operation range	Ambient	Cooling	°F (°C)	–	50 ~ 114.8 (10 ~ 46)
		Heating	°F (°C)	-4 ~ 95 (-20 ~ 35)	-4 ~ 95 (-20 ~ 35)
	Waterside	Heating	°F (°C)	–	41 ~ 76.6 (5 ~22)
		Heating (5)	°F (°C)	59 ~ 131 (15 ~ 55)	59 ~ 131 (15 ~ 55)
NOTES:	* (1) With option kit EKHBDP installed: Height = 36.85" (936 mm) * (2) Tamb 95°F (35°C) – LWE 44.6°F (7 C) (DT = 9°F (5°C) * (3) DB/WB 44.6°F/42.8 F (7°C/6°C) – LWC 95°F (35°C) (DT = 9°F (5°C) * (4) The sound pressure level is measured via a microphone at 3.23 ft (1 m) from the unit. It is a relative value, depending on the distance and acoustic environment. The sound pressure level mentioned is valid for pump medium speed. * (5) 59°F~77°F (15°C~25°C): BUH only, no heat pump operation = during commissioning * (6) Including piping + PHE + backup heater / excluding expansion vessel				

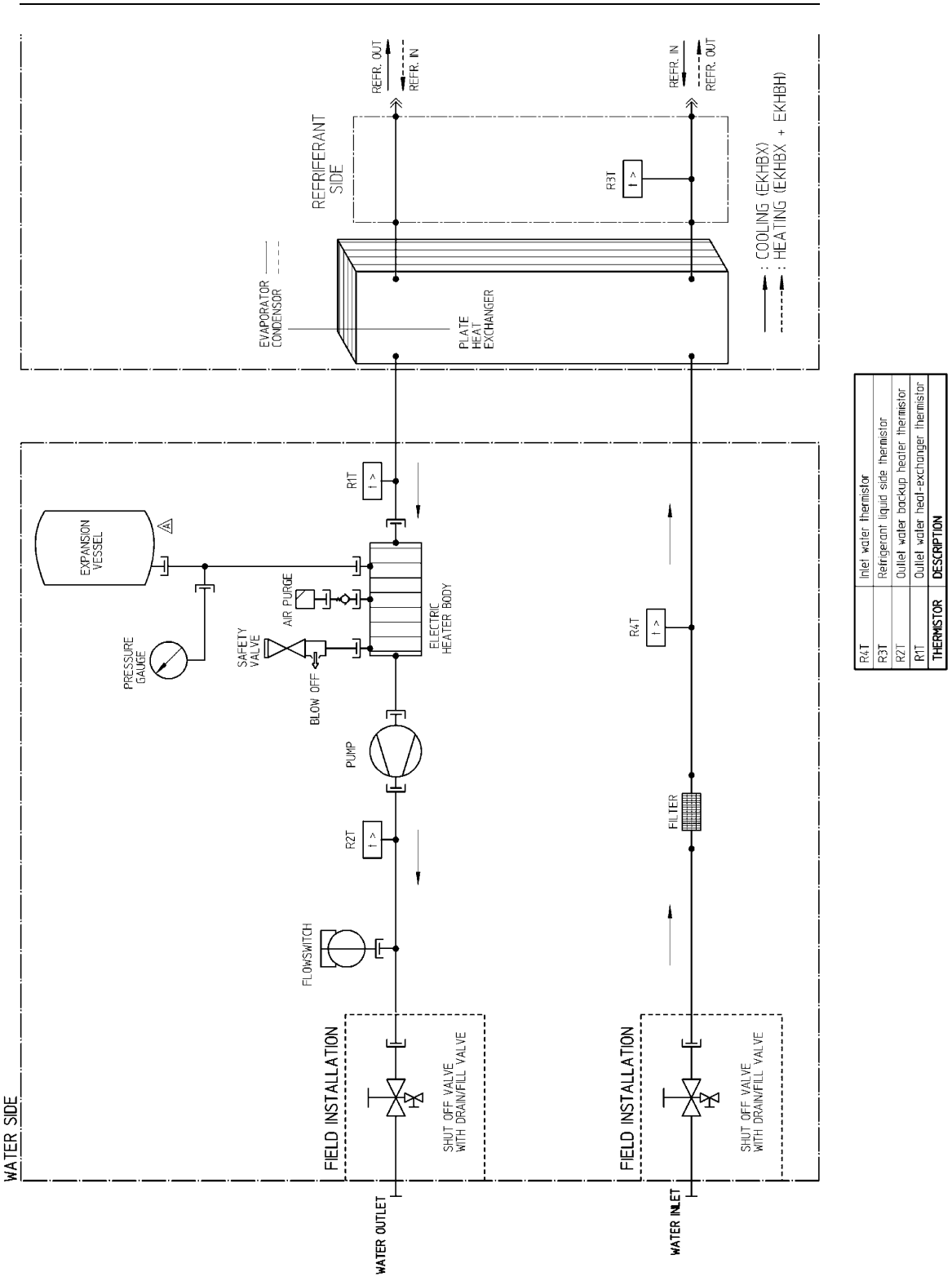
Electrical Specifiations

Electric heater (optional)	Type				3VJU	6VJU
	Power supply (1),(2)	Phase			1~	1~
		Frequency		Hz	60	60
		Voltage		V	208/230	208/230
	Current	Minimum Circuit Amps (MCA)		A	14.3	28.6
		Maximum Overcurrent Protection (MOP)		A	20	30
Voltage range	Minimum			V	187	
	Maximum			V	253	
Wiring connections	for power supply backup heater	quantity of wires			3G	
		type of wires			Note (3)	
	for power supply connection to optional domestic hot water tank + Q2L	quantity of wires			3G	
		type of wires			Note (3) & (4)	
	for connection with RST	quantity of wires			Note (7)	
		type of wires			Note (7)	
	for connection with A3P	quantity of wires			Note (6)	
		type of wires			Note (3) & (5)	
	for connection with M2S	quantity of wires			3G	
		type of wires			Note (3) & (5)	
	for connection with M3S	quantity of wires			3G or 4G	
		type of wires			Note (3) & (5)	
	for connection of bottom plate heater	quantity of wires			2	
		type of wires			Note (3)	
NOTES	* (1) Above mentioned power supply of hydrobox is fro backup heater only. The Switch box & pump of the hydrobox are supplied via the outdoor unit. The optional domestic hot water tank has a separate power supply. * (2) Optional electric heater has 2 capacity steps except for the 3VJU model which has only 1 capacity step. * (3) Select diameter and type according to local laws and regulations. * (4) For more details of the voltage range and current, refer to installation manual EKHBH/X054BA* * (5) Voltage: 24V / Maximum current: 100mA / Minimum AWG 18 (0.77MM^2) * (6) Depends on thermostat type; refer to Installation Manual for EKHBH/X054BA* * (7) Wire included in Option EKHWS*					

3. Dimensional Dwg. & Center of Gravity- Hydrobox

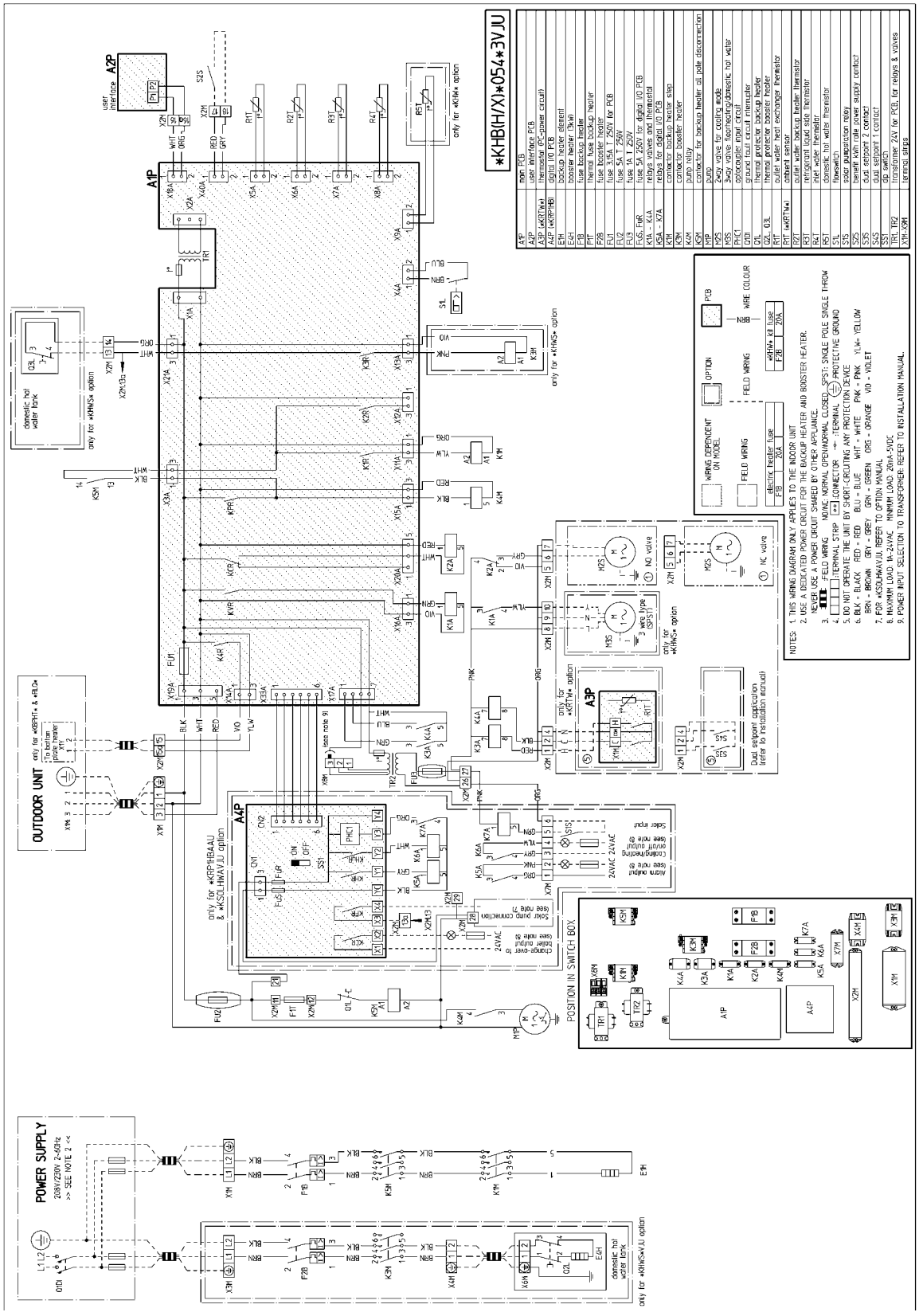

NOTE: UNIT OF MEASURE: inch (mm)
1 HOLES FOR FIXATION TO THE WALL
2 WATER OUT CONNECTION (1-1/4" M BSP)
3 WATER IN CONNECTION (1-1/4" M BSP)
4 REFRIGERANT LIQUID CONNECTION 3/8" (Ø9.52) FLARE
5 REFRIGERANT SUCTION CONNECTION 5/8" (Ø15.9) FLARE
6 PUMP (INCLUDING SWITCH FOR SPEED SETTING)
7 USER INTERFACE
8 SAFETY VALVE (PRESSURE)
9 AIR PURGE
10 EXPANSION VESSEL
11 PRESSURE GAUGE
12 DRAIN HOSE FROM SAFETY VALVE 0.79" (Ø20)
13 HEAT EXCHANGER (REFRIGERANT / WATER)
14 SHUT OFF VALVE WITH DRAIN / FILL VALVE (1-1/4" M BSP) (INCLUDED ACCESSORY)
15 WATER FILTER
16 (KNOCK-OUT) HOLES FOR WIRE ENTRANCE
17 SERVICE DOOR
18 SWITCHBOX TERMINALS
19 SWITCHBOX TERMINALS FOR DOMESTIC HOT WATER TANK (OPTION)
20 WALLBRACKET
21 AIR PRESSURE VALVE
VIEW A-A
REQUIRED SPACE FOR SERVICE AND VENTILATION
CENTRE OF GRAVITY

4. Piping Diagram - Hydrobox

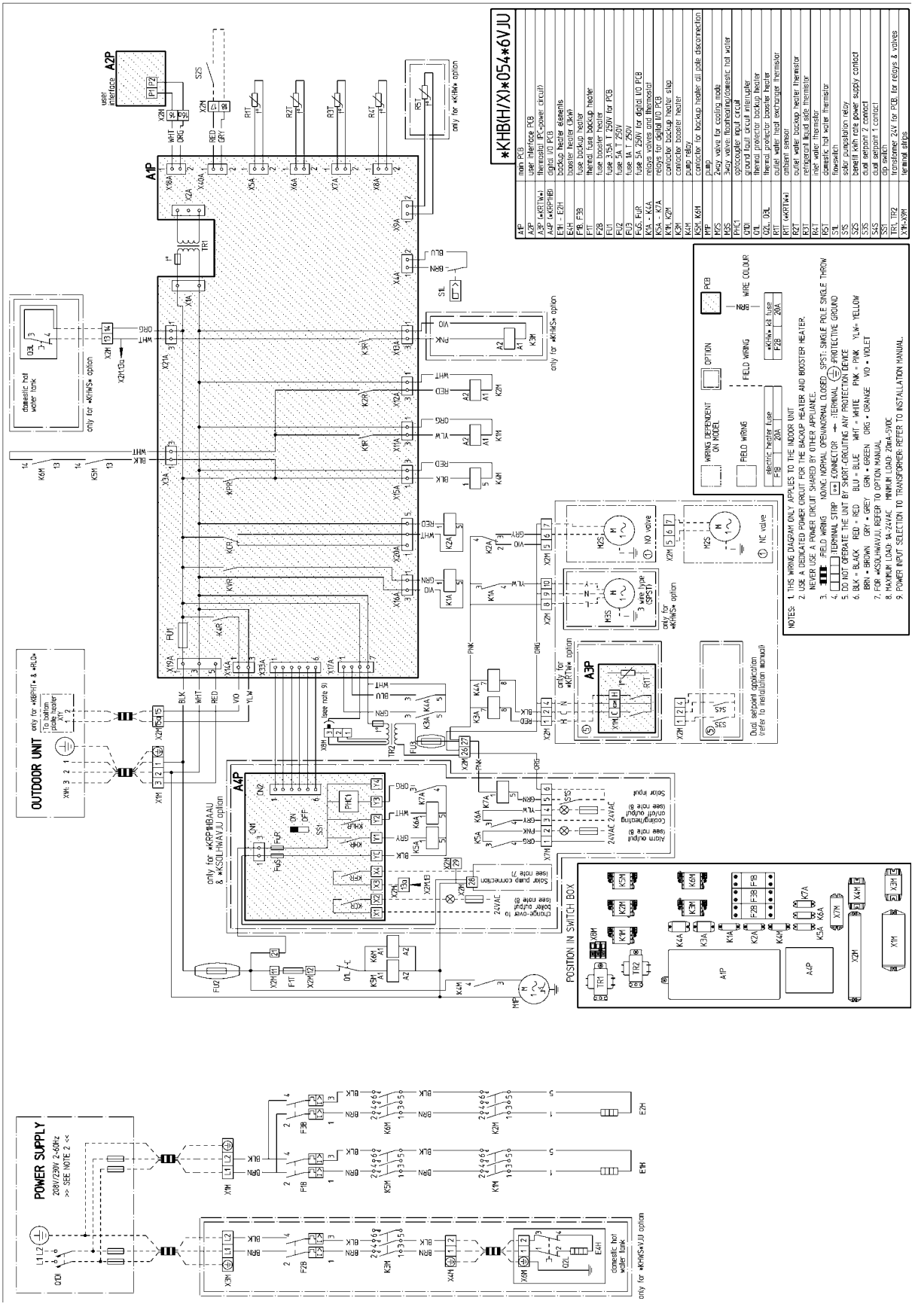


5. Wiring Diagram - Hydrobox

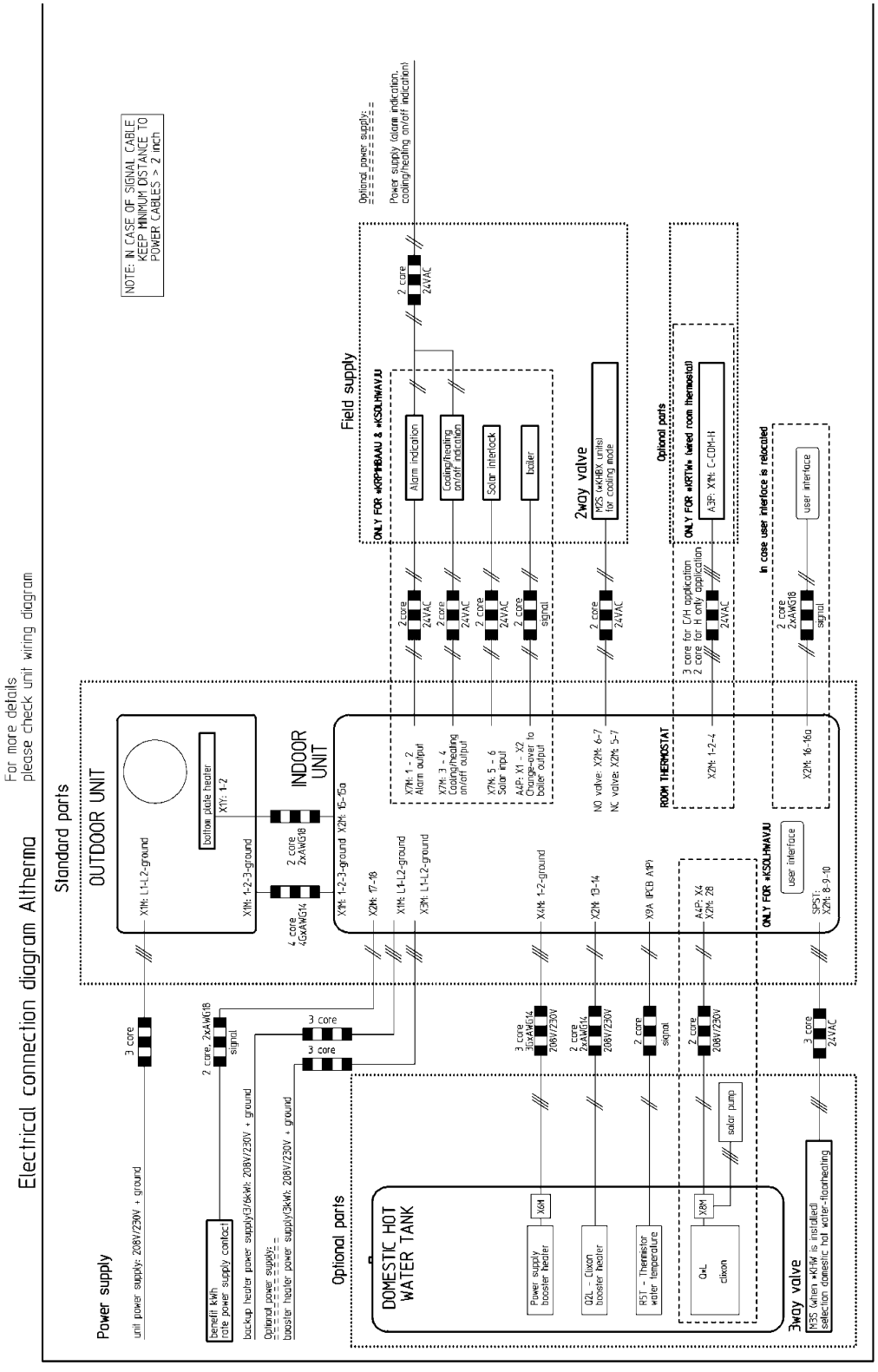
5.1 EKHB(H/X)054BA3VJU



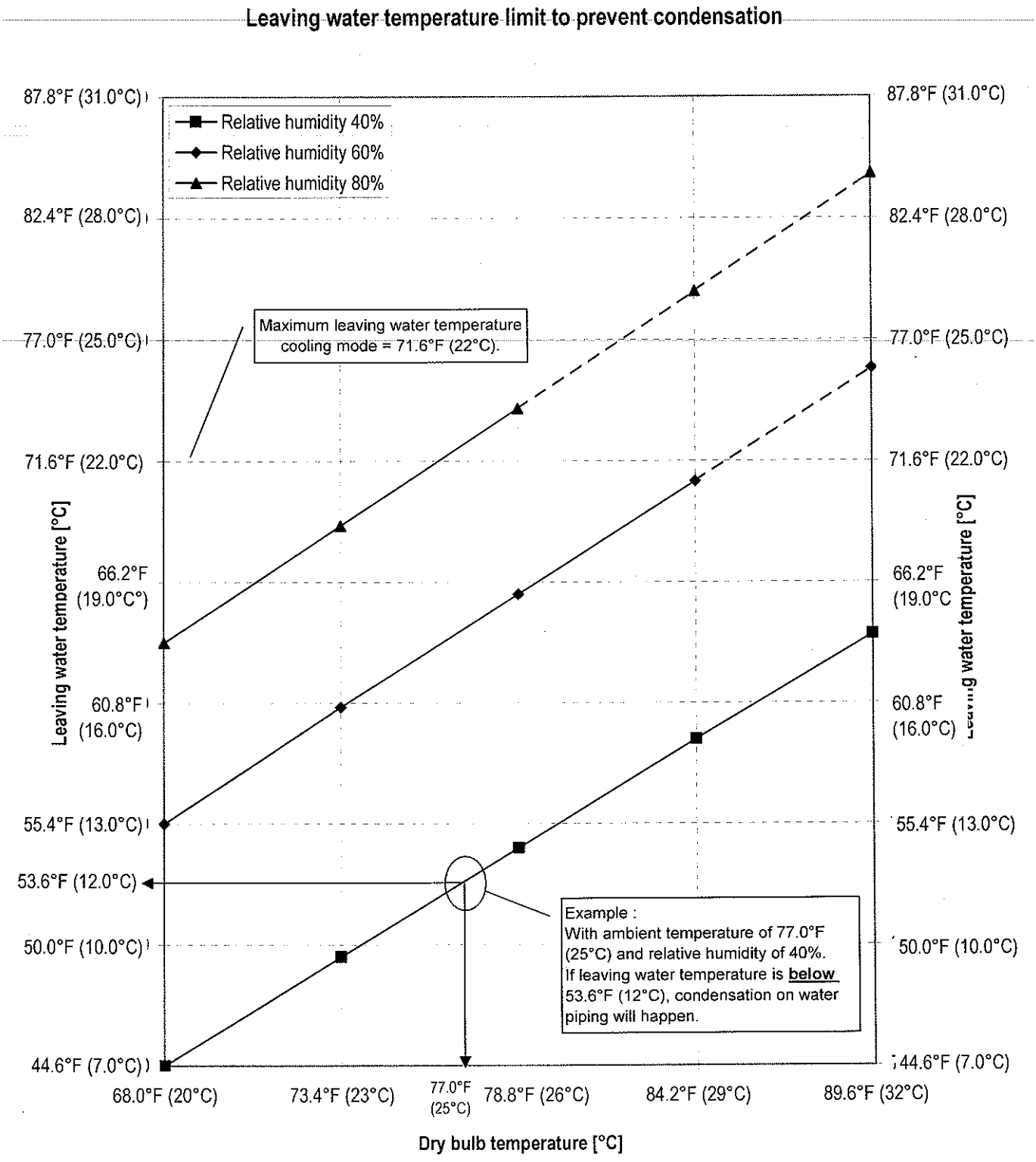
5.2 EKHB(H/X)054BA6VJU


*KHB(H/X)*054*6VJU
A1P main PCB
A2P user interface PCB
A3P (*KRTW*) thermistal (PC-power circuit)
A4P (*KRP*HB) digital I/O PCB
E1H - E2H backup heater elements
E4H booster heater (2kW)
F1B, F3B fuse backup heater
F1T thermal fuse backup heater
F2B fuse booster heater
FU1 fuse 315A T 250V for PCB
FU2 fuse 5A T 250V
FU3, FU5 fuse 5A T 250V for digital I/O PCB
K1A - K4A relays for digital I/O PCB
K5A - K7A relays for digital I/O PCB
K1M, K2M contactor backup heater step
K3M contactor booster heater
K4M pump relay
K5M, K6M contactor for backup heater all pole disconnection
MP pump
M2S 2way valve for cooling mode
M3S 3way valve: floorheating/domestic hot water
PHC1 optocoupler input circuit
Q1R ground fault circuit interrupter
Q1L, Q2L thermal protector backup heater
Q2L, Q3L thermal protector booster heater
R1T (*KRTW*) ambient, refrigerant heat exchanger thermistor
R2T outlet water backup heater thermistor
R3T refrigerant liquid side thermistor
R4T inlet water thermistor
R5T domestic hot water thermistor
S1L flowswitch
S1S solar pump relation relay
S2S benefit kWh rate power supply contact
S3S dual setpoint 2 contact
S4S dual setpoint 1 contact
S5S dp switch
TR1, TR2 transformer: 24V for PCB, for relays & valves
X1M, X2M terminal strips
NOTES: 1. THIS WIRING DIAGRAM ONLY APPLIES TO THE INDOOR UNIT
2. USE A DEDICATED POWER CIRCUIT FOR THE BACKUP HEATER AND BOOSTER HEATER. NEVER USE A POWER CIRCUIT SHARED BY OTHER APPLIANCE.
3. FIELD WIRING NO/NC: NORMAL OPEN/NORMAL CLOSED, SPST: SINGLE POLE SINGLE THROW
4. TERMINAL STRIP CONNECTOR : TERMINAL : PROTECTIVE GROUND
5. DO NOT OPERATE THE UNIT BY SHORT-CIRCUITING ANY PROTECTION DEVICE
6. BLK = BLACK RED = RED BLU = BLUE WHT = WHITE PNK = PINK YLW= YELLOW
BRN = BROWN GRY = GREY GRN = GREEN ORG = ORANGE VIO = VIOLET
7. FOR *KSOLHWAVJU, REFER TO OPTION MANUAL.
8. MAXIMUM LOAD: 1A 24VAC MINIMUM LOAD: 20mA 5VDC
9. POWER INPUT SELECTION TO TRANSFORMER: REFER TO INSTALLATION MANUAL.
WIRING DEPENDENT ON MODEL
FIELD WIRING
electric heater fuse
F1B 20A
F2B 20A
OPTION
PCB
WIRE COLOUR
KHW kit fuse
OUTDOOR UNIT
POWER SUPPLY
208V/230V 2~60Hz
>> SEE NOTE 2 <<
POSITION IN SWITCH BOX
domestic hot water tank
user interface
room thermostat
only for *KHW* option
only for *KHWS* option
only for *KRP1*A* & *KLO*
only for *KRP*HBAAU & *KSOLHWAVJU option
only for *KRTW* option
only for *KHWS* option
Dual setpoint application (refer to installation manual)
Solar pump connection (see note 7)
Alarm output/ Cooling/heating/ Shift output (see note 8)
Solar input

6. External Connection Diagram - Hydrobox



7. Condensate Instructions - Hydrobox



1. Refer to psychometric chart for more information.
2. If condensation is expected, installation of EKHBDP - drainpan kit must be considered.

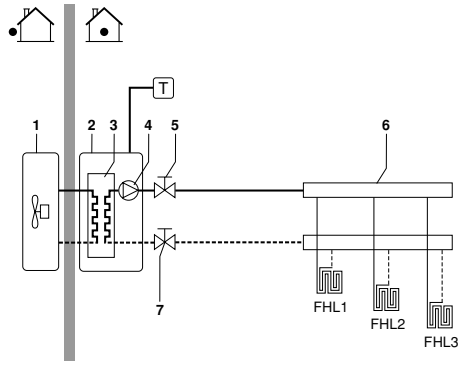
8. Application Examples - Hydrobox

TYPICAL APPLICATION EXAMPLES

The application examples given below are for illustration purposes only.

Application 1

Space heating only application with the room thermostat connected to the indoor unit.



1	Outdoor unit	**6**	Collector (field supply)
2	Indoor unit	**7**	Shut-off valve
3	Heat exchanger	**FHL1..3**	Floor heating loop
4	Pump	**T**	Room thermostat (optional)
5	Shut-off valve		

Pump operation and space heating

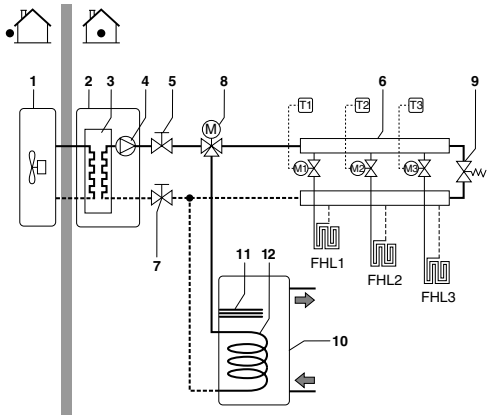
When the room thermostat (T) is connected to the indoor unit, the pump (4) will operate when there is a heating request from the room thermostat, and the outdoor unit will start operating to achieve the target leaving water temperature as set on the user interface.

When the room temperature is above the thermostat set point, the outdoor unit and pump will stop operating.

Make sure to connect the thermostat wires to the correct terminals (see "Connection of the thermostat cable" on page 18) and to configure the DIP switch toggle switches correctly (see "Room thermostat installation configuration" on page 22).

Application 2

Space heating only application without room thermostat connected to the indoor unit. The temperature in each room is controlled by a valve on each water circuit. Domestic hot water is provided through the domestic hot water tank which is connected to the indoor unit.



1	Outdoor unit	**9**	By-pass valve (field supply)
2	Indoor unit		
3	Heat exchanger	**10**	Domestic hot water tank (optional)
4	Pump		
5	Shut-off valve	**11**	Booster heater
6	Collector (field supply)	**12**	Heat exchanger coil
7	Shut-off valve	**FHL1..3**	Floor heating loop
8	Motorised 3-way valve (delivered with domestic hot water tank)	**T1..3**	Individual room thermostat (optional)
		M1..3	Individual motorised valve to control loop FHL1 (field supply)

Pump operation

With no thermostat connected to the indoor unit (2), the pump (4) can be configured to operate either as long as the indoor unit is on, or until the required water temperature is reached.

NOTE Details on pump configuration can be found under "Pump operation configuration" on page 23.

Space heating

The outdoor unit (1) will operate to achieve the target leaving water temperature as set on the user interface.

NOTE When circulation in each space heating loop (FHL1..3) is controlled by remotely controlled valves (M1..3), it is important to provide a by-pass valve (9) to avoid the flow switch safety device from being activated.

The by-pass valve should be selected as such that at all time the minimum water flow as mentioned under "Water pipework" on page 14 is guaranteed.

It is recommended to select a pressure difference controlled by-pass valve.

1	Outdoor unit	**14**	Motorised 2-way valve for activation of the room thermostat (field supply)
2	Indoor unit		
3	Heat exchanger		
4	Pump	**FCU1..3**	Fan coil unit with thermostat (optional)
5	Shut-off valve		
6	Collector (field supply)	**FHL1..3**	Floor heating loop
7	Shut-off valve	**T**	Heating only room thermostat (optional)
9	By-pass valve (field supply)		
13	Motorised 2-way valve to shut off the floor heating loops during cooling operation (field supply)	**T4..6**	Individual room thermostat for fan coil heated/cooled room (optional)

Pump operation

With no thermostat connected to the indoor unit (2), the pump (4) can be configured to operate either as long as the indoor unit is on, or until the required water temperature is reached.

NOTE Details on pump configuration can be found under "Pump operation configuration" on page 23.

Space heating and cooling

According to the season, the customer will select heating or cooling through the user interface on the indoor unit.

The outdoor unit (1) will operate in heating mode or cooling mode to achieve the target leaving water temperature.

With the unit in heating mode, the 2-way valve (13) is open. Hot water is provided to both the fan coil units and the floor heating loops.

With the unit in cooling mode, the 2-way valve (13) is closed to prevent cold water running through the floor heating loops (FHL).

When closing several loops in the system by remotely controlled valves, it might be required to install a by-pass valve (9) to avoid the flow switch safety device from being activated. See also "Application 2" on page 4.

Wiring of the 2-way valve (13) is different for a NC (normal closed) valve and a NO (normal open) valve! Make sure to connect to the correct terminal numbers as detailed on the wiring diagram.

The ON/OFF setting of the heating/cooling operation is done by the user interface on the indoor unit.

Application 5

Space heating with an auxiliary boiler (alternating operation)

Space heating application by either the Daikin indoor unit or by an auxiliary boiler connected in the system. The decision whether either the EKHB indoor unit or the boiler will operate can be achieved by an auxiliary contact or an EKHB* indoor controlled contact.*

The auxiliary contact can e.g. be an outdoor temperature thermostat, an electricity tariff contact, a manually operated contact, etc. See "Field wiring configuration A" on page 7.

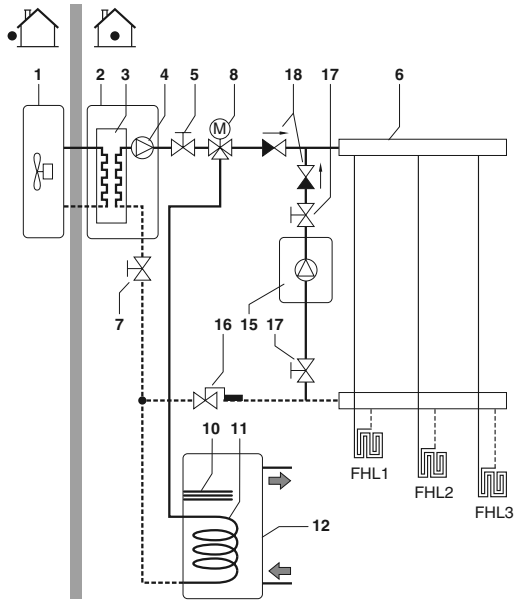
The EKHB indoor unit controlled contact (also called 'permission signal for the auxiliary boiler") is determined by the outdoor temperature (thermistor located at the outdoor unit). See "Field wiring configuration B" on page 7.*

Bivalent operation is only possible for space heating operation, **not** for the domestic water heating operation. Domestic hot water in such an application is always provided by the domestic hot water tank which is connected to the Daikin indoor unit.

The auxiliary boiler must be integrated in the piping work and in the field wiring according to the illustrations below.

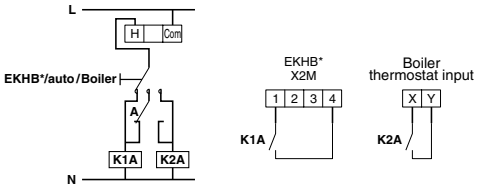
CAUTION

- Be sure that the boiler and the integration of the boiler in the system is in accordance with relevant local laws and regulations.
- Daikin can not be put responsible for incorrect or unsafe situations in the boiler system.



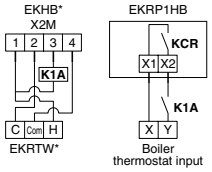
1	Outdoor unit	**11**	Heat exchanger coil
2	Indoor unit	**12**	Domestic hot water tank (optional)
3	Heat exchanger		
4	Pump	**15**	Boiler (field supply)
5	Shut-off valve	**16**	Aquastat valve (field supply)
6	Collector (field supply)		
7	Shut-off valve	**17**	Shut-off valve (field supply)
8	Motorised 3-way valve (delivered with the domestic hot water tank)	**18**	Non-return valve (field supply)
		FHL1...3	Floor heating loop (field supply)
10	Booster heater		

Field wiring configuration A



Boiler thermostat input	Boiler thermostat input
A	Auxiliary contact (normal closed)
H	Heating demand room thermostat (optional)
K1A	Auxiliary relay for activation of EKHB* unit (field supply)
K2A	Auxiliary relay for activation of boiler (field supply)

Field wiring configuration B



Boiler thermostat input	Boiler thermostat input
C	Cooling demand room thermostat (optional)
H	Heating demand room thermostat (optional)
Com	Common room thermostat (optional)
K1A	Auxiliary relay for activation of bolier unit (field supply)
KCR	Permission signal for the auxiliary boiler

Operation

■ **Configuration A**

When the room thermostat requests heating, either the EKHB* unit or the boiler starts operating, depending on the position of the auxiliary contact (A).

■ **Configuration B**

When the room thermostat requests heating, either the EKHB* unit or the boiler starts operating, depending on the outdoor temperature (status of "permission signal for the auxiliary boiler").

When the permission is given towards the boiler, the space heating operation by the EKHB* unit will be automatically switched off.

For more details see field setting [C-02~C-04].

NOTE

■ **Configuration A**
Make sure that auxiliary contact (A) has sufficient differential or time delay so as to avoid frequent changeover between the EKHB* unit and the boiler. If the auxiliary contact (A) is an outdoor temperature thermostat, make sure to install the thermostat in the shade, so that it is not influenced or turned ON/OFF by the sun.

Configuration B
Make sure that the bivalent hysteresis [C-04] has sufficient differential to avoid frequent changeover between the EKHB* unit and the boiler. As the outdoor temperature is measured via the outdoor unit, air thermistor make sure to install the outdoor unit in the shade, so that it is not influenced by the sun.

Frequent switching may cause corrosion of the boiler in an early stage. Contact the manufacturer of the boiler.

■ During heating operation of the EKHB* unit, the unit will operate so as to achieve the target leaving water temperature as set on the user interface. When weather dependent operation is active, the water temperature is determined automatically depending on the outdoor temperature.

During heating operation of the boiler, the boiler will operate so as to achieve the target leaving water temperature as set on the boiler controller.

Never set the target leaving water temperature set point on the boiler controller above 131°F (55°C).

■ Make sure to only have 1 expansion vessel in the water circuit. An expansion vessel is already premounted in the Daikin indoor unit.

NOTE

Make sure to configure the DIP switch SS2-3 on the PCB of the EKHB* switchbox correctly. Refer to "Room thermostat installation configuration" on page 22.

For configuration B: Make sure to configure the field settings [C-02, C-03 and C-04] correctly. Refer to "Bivalent operation" on page 32.

CAUTION

Make sure that return water to the EKHB* heat exchanger never exceeds 131°F (55°C).

For this reason, never put the target leaving water temperature set point on the boiler controller above 131°F (55°C) and install an aquastat[(a)] valve in the return water flow of the EKHB* unit.

Make sure that the non-return valves (field supply) are correctly installed in the system.

Make sure that the room thermostat (th) is not frequently turned ON/OFF.

Daikin shall not be held liable for any damage resulting from failure to observe this rule.

(a) The aquastat valve must be set for 131°F (55°C) and must operate to close the return water flow to the unit when the measured temperature exceeds 131°F (55°C). When the temperature drops to a lower level, the aquastat valve must operate to open the return water flow to the EKHB* unit again.

Manual permission towards the EKHB* unit on the boiler.

In case only the EKHB* unit should operate in space heating mode, disable the bivalent operation via setting [C-02].

In case only the boiler should operate in space heating mode, increase the bivalent ON temperature [C-03] to 77°F (25°C).

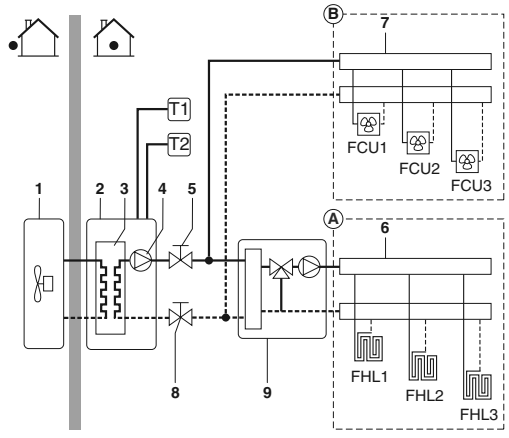
Application 6

Space heating with room thermostat application through floor heating loops and fan coil units. The floor heating loops and fan coil units require different operating water temperatures.

The floor heating loops require a lower water temperature in heating mode compared to fan coil units. To achive these two set points, a mixing station is used to adapt the water temperature according to requirements of the floor heating loops. The fan coil units are directly connected to the indoor unit water circuit and the floor heating loops after the mixing station. The control of this mixing station is not done by the indoor unit.

The operation and configuration of the field water circuit is the responsibility of the installer.

Daikin only offers a dual set point control function. By this function two set points can be generated. Depending on the required water temperature (floor heating loops and/or fan coil units are required) first set point or second set point can be activated.



1	Outdoor unit	**8**	Shut-off valve
2	Indoor unit	**9**	Mixing station (field supply)
3	Heat exchanger	**T1**	Room thermostat for zone A (optional)
4	Pump		
5	Shut-off valve	**T2**	Room thermostat for zone B (optional)
6	Collector zone A (field supply)	**FCU1..3**	Fan coil unit (optional)
7	Collector zone B (field supply)	**FHL1...3**	Floor heating loop (field supply)

The advantage of the dual set point control is that the heat pump will/can operate at the lowest required leaving water temperature when only floor heating is required. Higher leaving water temperatures are only required in case fan coil units are operating.
This results in a better performance of the heat pump.

Pump operation and space heating

When the room thermostat for the floor heating loop (T1) and the fan coil units (T2) are connected to the indoor unit, the pump (4) will operate when there is a request for heating from T1 and/or T2. The outdoor unit will start operating to achieve the target leaving water temperature. The target leaving water temperature depends on which room thermostat is requesting heating.

	Set point	Field setting	Thermo status			
Zone A	First	UI	ON	OFF	ON	OFF
Zone B	Second	[7-03]	OFF	ON	ON	OFF
Resulting water temperature			UI	[7-03]	[7-03]	—
Result pump operation			ON	ON	ON	OFF

When the room temperature of both zones is above the thermostat set point, the outdoor unit and pump will stop operating.

NOTE

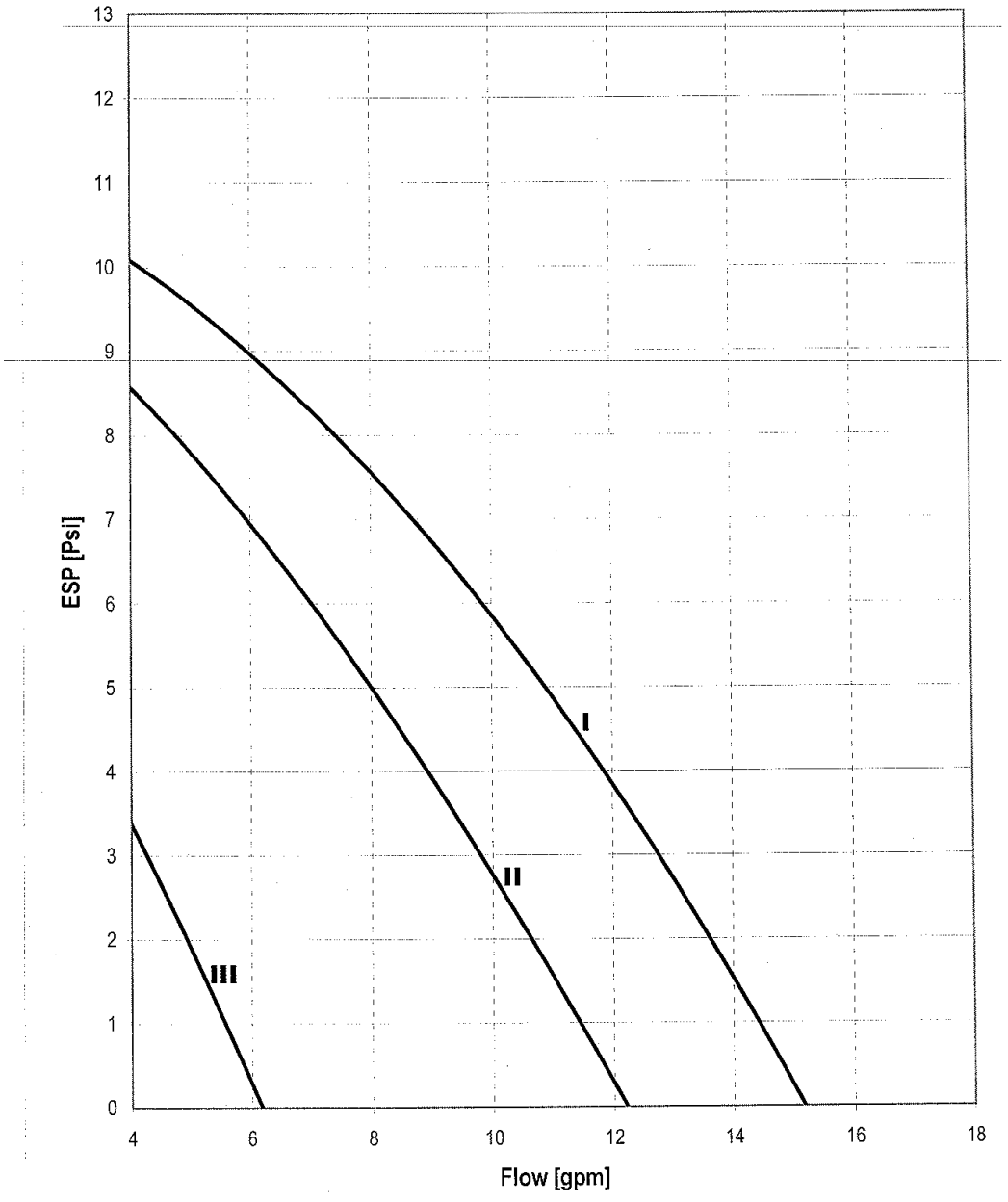
- Make sure to connect the thermostat wires to the correct terminals (see "Overview of the indoor unit" on page 9).
- Make sure to configure the field settings [7-02], [7-03] and [7-04] correctly. Refer to "Dual set point control" on page 29.
- Make sure to configure the DIP switch SS2-3 on the PCB of the EKHBH switch box correctly. Refer to "Room thermostat installation configuration" on page 22.

NOTE

- The request signals for space heating can be implemented in two different ways (installer choice).
  - Thermo ON/OFF signal from room thermostat
  - Status signal (active/not active) from the mixing station
- It is the installers responsibility to make sure no unwanted situations can occur (e.g. too high water temperatures towards floor heating loops, etc.)
- Daikin does not offer any type of mixing station. Dual set point control only provides the possibility to use two set points.
- When only zone A request heating, zone B will be fed with water at a temperature equal to the first set point.
  This can lead to unwanted heating of zone B.
- When only zone B request heating, the mixing station will be fed with water at a temperature equal to the second set point.
  Depending on the control of the mixing station, the floor heating loop can still receive water at a temperature equal to set point of the mixing station.

Be aware that the actual water temperature through the floor heating loops depends on the control and setting of the mixing station.

9. Hydronic Performance - Hydrobox

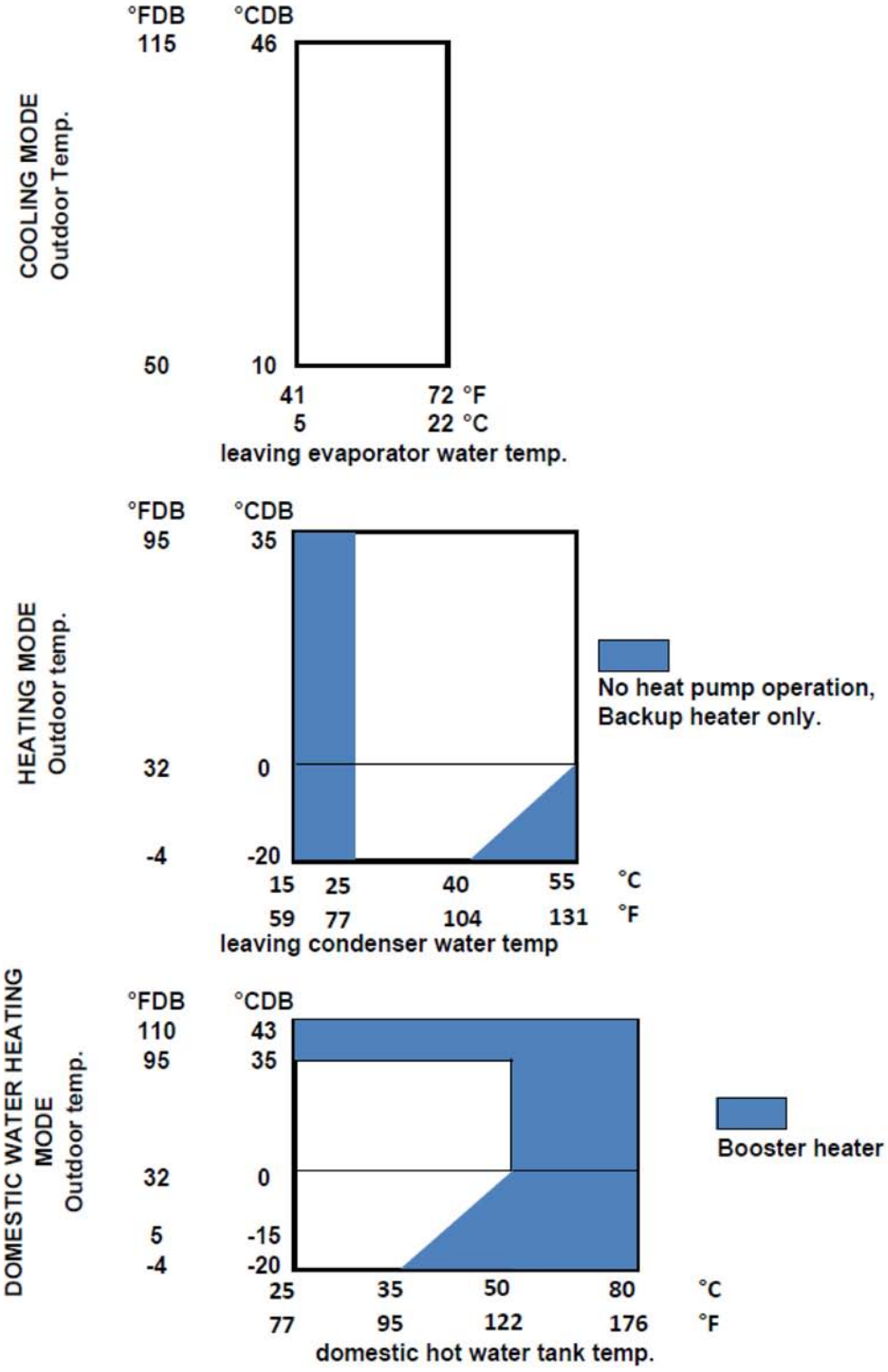


I high speed
II medium speed
III low speed
ESP : external static pressure
Flow : waterflow through the unit

IMPERIAL UNITS OF MEASURE

Caution :
Selecting a flow outside the curves can cause damage to or malfunction of the unit. See also minimum and maximum allowed water flowrange in the technical specifications.

10. Operation Range - Hydrobox



1. Monobloc - EDLQ / EBLQ

1.1 Features

- Heating only (EDLQ) and reversible (EBLQ) monobloc with base pan heater
- Inverter operated compressor
- H2O piping between outdoor unit and indoor heating appliances
- Freeze protection of hydronic parts
- Cost effective alternative to a fossil fuel boiler
- Interface control with field selectable options that include dual setpoint (heating & cooling), quiet mode, DHW priority settings, and schedule timer.
- Low energy bills and low CO2 emissions
- Easy to install
- Total solution for year round comfort
- Anti-corrosion treatment on outdoor coil

Monobloc

The monobloc unit is designed for outdoor installations. These units are used for both heating and cooling applications and can be combined with fan coil units, floor heating applications, low temperature radiators, optional Daikin domestic hot water tank, and optional Daikin solar kit.

The unit range consists of two main versions: a heating only version (EDLQ) and a heating/cooling version (EBLQ). Both versions are delivered with an integrated backup heater for additional heating capacity during cold outdoor temperatures. The backup heater also sesrves as a backup in the event malfunctioning of the unit occurs, along with freeze protection of the outside water piping during winter climates.

2. Specifications – EDLQ – Heat Only

2-1 NOMINAL CAPACITY AND NOMINAL INPUT				EDLQ036BA6VJU	EDLQ048BA6VJU	EDLQ054BA6VJU
Condition 1 (Floor heating)	Heating capacity	Nominal	kBTU/hr	38.21	47.77	54.59
	Heating PI	Nominal	kW	2.53	3.33	3.93
	COP	Nominal		4.42	4.2	4.07
Condition 2 (Fan Coil)	Heating capacity	Nominal	kBTU/hr	37.07	44.17	51.39
	Heating PI	Nominal	kW	3.43	3.98	4.75
	COP	Nominal		3.25	3.25	3.17
Notes				Condition 1: heating Ta DB/WB 44.6 / 42.8°F (7°C/6°C) - LWC 95°F (35°C) ΔT=9°F (5°C)		
				Condition 2: heating Ta DB/WB 44.6 / 42.8°F (7°C/6°C) - LWC 113°F (45°C) (ΔT=9°F (5°C))		

2-2 TECHNICAL SPECIFICATIONS				EDLQ036BA6VJU	EDLQ048BA6VJU	EDLQ054BA6VJU
Casing	Colour			Ivory white		
	Material			Painted galvanised steel		
Dimensions	Unit	Height	in (mm)	55-7/8 (1,418)		
		Width	in (mm)	56-1/2 (1,435)		
		Depth	in (mm)	15-1/32 (382)	15-1/32 (382)	15-1/32 (382)
	Packing	Height	in (mm)	61-1/4 (1,557)		
		Width	in (mm)	59-1/16 (1,500)		
		Depth	in (mm)	16-7/8 (430)	16-7/8 (430)	16-7/8 (430)
Weight	Unit		lb (kg)	397 (180)	397 (180)	397b (180)
	Packed unit		lb (kg)	441 (200)	441 (200)	441 (200)
Packing	Material			Wood		
				Carton		
				Plastic foil		
	Weight		lb (kg)	44 lb (20)	44 lb (20)	44 lb (20)
Operation Range (2, 4)	Heating - Ambient	Min	°F (°C)	-4 (-20)	-4 (-20)	-4 (-20)
		Max	°F (°C)	95 (35)	95 (35)	95 (35)
	Heating - Waterside	Min	°F (°C)	59 (15)	59 (15)	59 (15)
		Max	°F (°C)	131 (55)	131 (55)	131 (55)
	Domestic hot water -Ambient	Min	°F (°C)	-4 (-20)	-4 (-20)	-4 (-20)
		Max	°F (°C)	109.4 (43)	109.4 (43)	109.4 (43)
	Domestic hot water - Waterside	Min	°F (°C)	77 (25)	77 (25)	77 (25)
		Max	°F (°C)	176 (80)	176 (80)	176 (80)
Sound Level (1) (nominal)	Heating	Sound Power	dBA	64	64	66
		Sound Pressure	dBA	51	51	52
Sound Level (Night quiet)	Heating	Sound Pressure	dBA	42	42	43
Refrigerant	Type			R-410A		
	Charge		lb (kg)	6.5 (2.95)	6.5 (2.95)	6.5 (2.95)
	Control			Electronic expansion valve		
	Nr of Circuits			1	1	1
Refrigerant Oil	Type			Daphne FVC68D		
	Charged Volume		oz (l)	34 (1.0 l)	34 (1.0 l)	34 (1.0 l)
Defrost Method				Pressure equalising		
Defrost Control				Sensor for outdoor heat exchanger temperature		
Capacity Control Method				Inverter controlled		
Safety Devices				High pressure switch		
				Fan motor thermal protector		
				Fuse		

2-2 TECHNICAL SPECIFICATIONS	EDLQ036BA6VJU	EDLQ048BA6VJU	EDLQ054BA6VJU
Notes			
(1) The sound pressure level is measured via a microphone at a certain distance from the unit. It is a relative value depending on the distance and acoustic environment. Refer to sound spectrum drawing for more information.			
(2) 59°–77°F (15°–25°C): BUH only, no heat pump operation = during commisioning			
(5) including piping + PHE + back-up heater / excluding expansion vessel			
(4) E(D)(B)L* model can reach -4°F (-20°C)			

2-3 MAIN COMPONENTS				EDLQ036BA6VJU	EDLQ048BA6VJU	EDLQ054BA6VJU
Air heat exchanger	Specifications	Length	in (mm)	33-3/4 (857)	33-3/4 (857)	33-3/4 (857)
		Nr of Rows		2	2	2
		Fin pitch	in (mm)	1/16 (1.4)	1/16 (1.4)	1/16 (1.4)
		Nr of Passes		5	5	5
		Face area	ft² (m²)	12.17 (1.131)	12.17 (1.131)	12.17 (1.131)
		Nr of Stages		60	60	60
	Tube type			Hi-XSS		
	Fin	Type		WF fin		
		Treatment		Anti-corrosion treatment (PE)		
Fan	Type			Propeller		
	Quantity			2	2	2
Air Flow Rate (nominal at 230V)	Heating	High	cfm (m³/min)	3178 (90)	3178 (90)	3178 (90)
Fan	Discharge direction			Horizontal		
	Motor	Quantity		2	2	2
		Model		Brushless DC		
Motor	Speed (nominal)	Steps		8	8	8
		Heating	rpm	760	760	760
Fan	Motor	Output	W	70	70	70
		Drive		Direct drive		
Compressor	Quantity			1	1	1
	Motor	Model		JT100G-VD		
		Type		Hermetically sealed scroll compressor		
		Motor Output	W	2,200		
		Starting Method		Inverter driven		
Motor	Crankcase Heater	Output	W	33	33	33
Pump	Type			Water cooled		
	Nr. of speed			2	2	2
	Nominal ESP unit	Heating	PSI (kPa)	7.61 PSI (52.5 kPa)	6.31 PSI (43.5 kPa)	5 PSI (35 kPa)
	Power input		W	210	210	210
Water side Heat exchanger	Type			Brazed plate		
	Quantity			1	1	1
	Water volume		gal (l)	0.27 (1.01)	0.27 (1.01)	0.27 (1.01)
	Water flow rate Min.		gpm (l/min)	4.23 (16)	4.23 (16)	4.23 (16)
	Water flow rate Nom.	Heating	gpm (l/min)	8.5 (32.1)	10.6 (40.1)	12.1 (45.9)
	Water flow rate Max.		gpm (l/min)	15.3 (58)	15.3 (58)	15.3 (58)
	Insulation material			Foamed synthetic elastomer		
Expansion vessel	Volume		gal (l)	2.64 (10)	2.64 (10)	2.64 (10)
	Maximum water pressure		PSI (bar)	43.5 (3)	43.5 (3)	43.5 (3)
	Pre pressure		PSI (bar)	14.5 (1.0)	14.5 (1.0)	14.5 (1.0)
Water filter	Diameter perforations		in (mm)	1/32 (1)	1/32 (1)	1/32 (1)
	Material			Brass		

2-3 MAIN COMPONENTS			EDLQ036BA6VJU	EDLQ048BA6VJU	EDLQ054BA6VJU
Water circuit	Piping connections	inch	1-1/4 BSPP male		
	Piping	inch	1-1/4		
	Safety valve	PSI (bar)	43.5 (3)	43.5 (3)	43.5 (3)
	Manometer (Pressure Gauge)		Yes		
	Drain valve / Fill valve		yes		
	Shut off valve		yes		
	Air purge valve		yes		
	Total water volume (3)	gal (l)	145 (5.5)	145 (5.5)	145 (5.5)

2-4 ELECTRICAL SPECIFICATIONS					EDLQ036BA6VJU	EDLQ048BA6VJU	EDLQ054BA6VJU
Power supply compressor component	Main Power	Name			VJ		
		Phase			1	1	1
		Frequency		Hz	60	60	60
		Voltage		V	208/230	208/230	208/230
Voltage Range		Minimum		V	-10%		
		Maximum		V	+10%		
Current		Compressor	Rated Load Amps (RLA)	A	23.4	23.4	23.4
		Total	Full Load Amps (FLA)	A	26.5	26.5	26.5
			MCA	A	26.5	26.5	26.5
			MOP	A	30	30	30
	Wiring connections	For power supply compressor component			Installation Instruction		
Power supply hydronic component	Current back-up heater	Type			Electric 6kW		
Current back-up heater	Power Supply	Phase			1~		
		Frequency		Hz	60	60	60
		Voltage		V	208/230	208/230	208/230
	Current	Minimum Circuit Amps (MCA)		A	28.6	28.6	28.6
		Maximum Overcurrent Protection (MOP)		A	30	30	30

2-4 ELECTRICAL SPECIFICATIONS					EDLQ036BA6VJU	EDLQ048BA6VJU	EDLQ054BA6VJU
Power supply hydronic component	Voltage range	Minimum		V	-10%		
		Maximum		V	+10%		
	Wiring connections	Connection type			for power supply hydraulic compartment		
		Quantity of wires			2G		
		Type of wires			Select diameter and type according to national and local regulations		
		Connection type			for power supply connection to optional sanitary tank + Q2L		
		Quantity of wires			3G		
		Type of wires			Select diameter and type according to national and local regulations		
		Type of wires			For more details on voltage range and current refer to installation manual.		
		Connection type			for connection with R5T		
		Quantity of wires			Wire included in option EKHWS*		
		Type of wires			Wire included in option EKHWS*		
		Connection type			for connection with A3P		
		Quantity of wires			Depends on thermostat type, refer to installation manual		
		Type of wires			Select diameter and type according to national and local regulations		
		Type of wires			For more details on voltage range and current refer to installation manual.		
		Connection type			for connection with M2S		
		Quantity of wires			3G		
		Type of wires			Select diameter and type according to national and local regulations		
		Type of wires			For more details on voltage range and current refer to installation manual.		
		Connection type			for connection with M3S		
		Quantity of wires			3G or 4G		
		Type of wires			Select diameter and type according to national and local regulations		
		Type of wires			For more details on voltage range and current refer to installation manual.		
	Notes				Power supply compressor compartment is for compressor, fan, pump and controller		
					Power supply hydraulic compartment is for the electric heater. The optional domestic warm water tank has a separate power supply.		
					Installer can reduce capacity of the heater from 20,491 to 10,245 BTU/hr (6 to 3kW). The current is then reduced from 26 to 13A. Instructions see installation manual.		
					Installer can reduce capacity of the heater from 20,491 to 11,953 BTU/hr (6 to 3kW). The current is then reduced from 8.7 to 5A. Instructions see installation manual.		
					Standard for safety heating and cooling equipment: UL1995/CSA (U&C) C22.2 #236		

3. Capacity Tables – EDLQ – Heat Only

MAXIMUM HEATING CAPACITY - PEAK VALUE

MODEL	LWC (°F/°C)	86/30			95/35			104/40			113/45			122/50			131/55		
	T_{amb} (°F/°C)	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	
E(D/B)LQ036BA6VJU	-4/-20	20.00	7.93	**2.52**	18.81	8.63	**2.18**												
	5/-15	22.61	8.04	**2.81**	21.25	8.76	**2.43**	20.78	9.61	**2.16**									
	19/-7.2	27.75	8.12	**3.42**	26.15	8.68	**3.01**	25.02	9.77	**2.56**	24.96	11.34	**2.20**						
	25/-3.9	31.66	8.12	**3.90**	29.90	8.90	**3.36**	29.38	9.81	**2.99**	28.70	11.41	**2.52**	27.66	12.65	**2.19**			
	36/2.2	35.22	8.08	**4.36**	33.34	8.89	**3.75**	32.83	9.82	**3.34**	32.15	11.43	**2.81**	31.06	12.69	**2.45**	29.02	14.10	**2.06**
	45/7.2	40.25	8.02	**5.02**	39.21	8.84	**4.44**	37.74	9.79	**3.85**	37.07	11.42	**3.25**	35.94	12.71	**2.83**	33.71	14.13	**2.39**
	54/12.2	43.65	7.80	**5.60**	41.57	8.62	**4.82**	41.17	9.58	**4.30**	40.57	11.21	**3.62**	39.47	12.50	**3.16**	37.16	13.92	**2.67**
	59/15	47.22	7.72	**6.12**	45.03	8.55	**5.27**	44.69	9.52	**4.69**	44.11	11.16	**3.95**	43.00	12.46	**3.45**	40.57	13.89	**2.92**
	68/20	53.68	7.58	**7.08**	51.33	8.41	**6.10**	51.07	9.40	**5.43**	50.57	11.06	**4.57**	45.01	12.36	**3.64**	45.45	13.81	**3.29**
E(D/B)LQ048BA6VJU	-4/-20	25.32	9.95	**2.54**	24.58	10.82	**2.27**												
	5/-15	28.29	10.15	**2.79**	27.29	11.03	**2.47**	26.34	12.07	**2.18**									
	19/-7.2	34.37	10.35	**3.32**	33.00	11.28	**2.93**	31.66	12.36	**2.56**	30.96	13.42	**2.31**						
	25/-3.9	39.11	10.44	**3.75**	37.52	11.39	**3.29**	35.95	12.49	**2.88**	35.11	13.58	**2.59**	34.57	14.97	**2.31**			
	36/2.2	43.50	10.48	**4.15**	41.72	11.45	**3.64**	39.98	12.57	**3.18**	39.02	13.67	**2.85**	38.40	15.08	**2.55**	36.62	16.64	**2.20**
	45/7.2	49.77	10.52	**4.73**	47.77	11.37	**4.20**	45.79	12.55	**3.65**	44.70	13.77	**3.25**	43.99	15.20	**2.89**	41.96	16.75	**2.51**
	54/12.2	52.69	10.21	**5.16**	50.62	11.18	**4.53**	48.57	12.31	**3.95**	47.45	13.42	**3.54**	46.73	14.83	**3.15**	44.60	16.38	**2.72**
	59/15	57.09	10.21	**5.59**	54.90	11.19	**4.91**	52.71	12.32	**4.28**	51.53	13.44	**3.83**	50.78	14.86	**3.42**	48.50	16.42	**2.95**
	68/20	65.14	10.22	**6.37**	62.72	11.20	**5.60**	60.30	12.34	**4.89**	59.03	13.47	**4.38**	50.58	14.89	**3.40**	54.08	16.46	**3.29**
E(D/B)LQ054BA6VJU	-4/-20	28.90	11.60	**2.49**	28.45	12.59	**2.26**												
	5/-15	32.20	11.83	**2.72**	31.42	12.86	**2.44**	30.68	14.05	**2.18**									
	19/-7.2	39.03	12.12	**3.22**	37.80	13.19	**2.87**	36.60	14.44	**2.53**	35.94	15.69	**2.29**						
	25/-3.9	44.41	12.27	**3.62**	42.91	13.36	**3.21**	41.43	14.83	**2.79**	40.58	15.91	**2.55**	39.07	17.52	**2.23**			
	36/2.2	49.40	12.37	**3.99**	47.69	13.48	**3.54**	45.99	14.77	**3.11**	44.96	16.05	**2.80**	43.24	17.68	**2.45**	41.51	19.49	**2.13**
	45/7.2	56.57	12.49	**4.53**	54.59	13.42	**4.07**	52.61	14.92	**3.53**	51.39	16.22	**3.17**	49.37	17.86	**2.76**	47.34	19.69	**2.40**
	54/12.2	58.99	12.18	**4.84**	56.94	13.28	**4.29**	54.88	14.57	**3.77**	53.60	15.85	**3.38**	51.48	17.46	**2.95**	49.35	19.25	**2.56**
	59/15	63.98	12.24	**5.23**	61.77	13.35	**4.63**	59.55	14.63	**4.07**	58.18	15.92	**3.65**	55.09	17.54	**3.14**	53.59	19.33	**2.77**
	68/20	73.10	12.37	**5.91**	70.64	13.47	**5.24**	68.16	14.76	**4.62**	66.63	16.06	**4.15**	64.05	17.68	**3.62**	61.45	19.47	**3.16**

Peak value does not include capacity drop during frosting and defrosting periods.

MAXIMUM HEATING CAPACITY - INTEGRATED VALUE

MODEL	LWC (°F/°C)	86/30			95/35			104/40			113/45			122/50			131/55		
	T_{amb} (°F/°C)	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP
E(D/B)LQ036BA6VJU	-4/-20	16.93	7.81	**2.17**	15.92	8.49	**1.88**												
	5/-15	19.14	7.91	**2.42**	17.99	8.62	**2.09**	17.59	9.45	**1.86**									
	19/-7.2	23.49	7.99	**2.94**	22.14	8.74	**2.53**	21.69	9.81	**2.21**	21.13	11.14	**1.90**						
	25/-3.9	26.27	7.84	**3.35**	24.82	8.60	**2.89**	24.38	9.47	**2.57**	23.82	11.00	**2.17**	22.95	12.20	**1.88**			
	36/2.2	29.23	7.81	**3.74**	27.67	8.58	**3.22**	27.25	9.47	**2.88**	26.88	11.02	**2.44**	25.78	12.23	**2.11**	24.09	13.59	**1.77**
	45/7.2	40.25	8.02	**5.02**	38.21	8.64	**4.42**	37.74	9.79	**3.85**	37.07	11.42	**3.25**	35.94	12.71	**2.83**	33.71	14.13	**2.39**
	54/12.2	43.66	7.80	**5.60**	41.57	8.62	**4.82**	41.17	9.58	**4.30**	40.57	11.21	**3.62**	39.47	12.50	**3.16**	37.16	13.92	**2.67**
	59/15	47.22	7.72	**6.12**	45.03	8.55	**5.27**	44.59	9.52	**4.68**	44.11	11.16	**3.95**	43.00	12.46	**3.45**	40.57	13.80	**2.94**
	68/20	53.68	7.58	**7.08**	51.33	8.41	**6.10**	51.07	9.40	**5.43**	50.57	11.06	**4.57**	48.01	12.36	**3.88**	45.45	13.81	**3.29**
E(D/B)LQ048BA6VJU	-4/-20	21.54	9.69	**2.22**	20.91	10.52	**1.99**												
	5/-15	24.07	9.87	**2.44**	23.21	10.73	**2.16**	22.40	11.73	**1.91**									
	19/-7.2	29.24	10.06	**2.91**	28.07	10.96	**2.56**	26.93	12.01	**2.24**	26.34	13.04	**2.02**						
	25/-3.9	31.09	9.51	**3.27**	29.83	10.37	**2.88**	28.58	11.30	**2.53**	27.91	12.36	**2.26**	27.48	13.62	**2.02**			
	36/2.2	34.58	9.53	**3.63**	33.17	10.42	**3.18**	31.78	11.44	**2.78**	31.02	12.44	**2.49**	30.52	13.71	**2.23**	29.12	15.13	**1.92**
	45/7.2	49.77	10.52	**4.73**	47.77	11.37	**4.20**	45.79	12.65	**3.62**	44.70	13.77	**3.25**	43.99	15.20	**2.89**	41.96	16.78	**2.50**
	54/12.2	52.69	10.21	**5.16**	50.02	11.18	**4.47**	48.57	12.31	**3.95**	47.45	13.42	**3.54**	46.73	14.83	**3.15**	44.60	16.38	**2.72**
	59/15	57.09	10.21	**5.59**	54.90	11.19	**4.91**	52.71	12.32	**4.28**	51.53	13.44	**3.83**	50.78	14.86	**3.42**	48.50	16.42	**2.95**
	68/20	65.14	10.22	**6.37**	62.72	11.20	**5.60**	60.30	12.34	**4.89**	59.03	13.47	**4.38**	56.58	14.89	**3.80**	54.08	16.46	**3.29**
E(D/B)LQ054BA6VJU	-4/-20	23.88	11.30	**2.11**	23.50	12.26	**1.92**												
	5/-15	26.60	11.52	**2.31**	25.96	12.52	**2.07**	25.35	13.69	**1.85**									
	19/-7.2	32.25	11.79	**2.74**	31.23	12.83	**2.43**	30.24	14.05	**2.15**	29.69	15.26	**1.95**						
	25/-3.9	33.97	10.97	**3.10**	32.63	11.95	**2.73**	31.70	13.09	**2.42**	31.03	14.23	**2.18**	29.89	15.67	**1.91**			
	36/2.2	37.79	11.04	**3.42**	36.48	12.03	**3.03**	35.19	13.19	**2.67**	34.40	14.34	**2.40**	33.08	15.80	**2.09**	31.75	17.42	**1.82**
	45/7.2	56.57	12.49	**4.53**	54.59	13.42	**4.07**	52.61	14.92	**3.53**	51.39	16.22	**3.17**	49.37	17.86	**2.76**	47.34	19.59	**2.42**
	54/12.2	58.99	12.18	**4.84**	58.94	13.26	**4.44**	54.88	14.57	**3.77**	53.60	15.85	**3.38**	51.46	17.46	**2.95**	49.35	19.25	**2.56**
	59/15	63.98	12.24	**5.23**	61.77	13.35	**4.63**	59.55	14.63	**4.07**	58.18	15.92	**3.65**	55.89	17.54	**3.19**	53.59	19.33	**2.77**
	68/20	73.10	12.37	**5.91**	70.64	13.47	**5.24**	68.15	14.76	**4.62**	66.63	16.06	**4.15**	64.05	17.68	**3.62**	61.45	19.47	**3.16**

Integrated value takes into consideration the capacity drop during frosting and defrosting periods.

4. Specifications – EBLQ Heat Pump

4-1 NOMINAL CAPACITY AND NOMINAL INPUT				EBLQ036BA6VJU	EBLQ048BA6VJU	EBLQ054BA6VJU
Condition 1 (Floor Heating)	Heating capacity	Nominal	kBTU/hr	38.21	47.77	54.59
	Cooling capacity	Nominal	kBTU/hr	43.83	54.57	57.07
	Heating PI	Nominal	kW	2.53	3.33	3.93
	Cooling PI	Nominal	kW	3.91	5.79	6.43
	COP	Nominal		4.54	4.37	4.22
	EER	Nominal		11.21	9.42	8.88
Condition 2 (Fan Coil)	Heating capacity	Nominal	kBTU/hr	37.07	44.17	51.39
	Cooling capacity	Nominal	kBTU/hr	34.17	42.69 (12.50)	44.74 (13.10)
	Heating PI	Nominal	kW	3.43	3.98	4.75
	Cooling PI	Nominal	kW	3.72	5.42	5.97
	COP	Nominal		3.37	3.35	3.26
	EER	Nominal		9.17	7.87	7.49
Notes				Condition 1: cooling Ta 95°F (35°C) - LWE 64.4°F (18°C) (ΔT=41°F (5°C); heating Ta DB/WB 44.6 / 42.8°F (7°C/6°C) - LWC 95°F (35°C) ΔT=41°F (5°C)		
				Condition 2: cooling Ta 95°F (35°C) - LWE 7°C (ΔT=5°C); heating Ta DB/WB 44.6 / 42.8°F (7°C/ 6°C) - LWC 113°F (45°C) (ΔT=41°F (5°C))		

4-2 TECHNICAL SPECIFICATIONS				EBLQ036BA6VJU	EBLQ048BA6VJU	EBLQ054BA6VJU
Casing	Colour			Ivory white		
	Material			Painted galvanised steel		
Dimensions	Unit	Height	in (mm)	55-7/8 (1,418)		
		Width	in (mm)	56-1/2 (mm)		
		Depth	in (mm)	15-1/32 (382)	15-1/32 (382)	15-1/32 (382)
	Packing	Height	in (mm)	61-1/4 (1,557)		
		Width	in (mm)	59-1/16 (1,500)		
		Depth	in (mm)	16-7/8 (430)	16-7/8 (430)	16-7/8 (430)
Weight	Unit		lb (kg)	397 (180)	397 (180)	397 (180)
	Packed unit		lb (kg)	441 (200)	441 (200)	441 (200)
Packing	Material			Wood		
				Carton		
				Plastic foil		
	Weight		lb (kg)	44 (20)	44 (20)	44 (20)
Operation Range (2 ,4)	Heating - Ambient	Min	°F (°C)	-4 (-20)	-4 (-20)	-4 (-20)
		Max	°F (°C)	95 (35)	95 (35)	95 (35)
	Heating - Waterside	Min	°F (°C)	59 (15)	59 (15)	59 (15)
		Max	°F (°C)	131 (55)	131 (55)	131 (55)
	Cooling - Ambient	Min	°F (°C)	50 (10)	50 (10)	50 (10)
		Max	°F (°C)	114.8 (46)	114.8 (46)	114.8 (46)
	Cooling - Waterside	Min	°F (°C)	-4 (-20)	-4 (-20)	-4 (-20)
		Max	°F (°C)	71.6 (22)	71.6 (22)	71.6 (22)
	Domestic hot water -Ambient	Min	°F (°C)	-4 (-20)	-4 (-20)	-4 (-20)
		Max	°F (°C)	109.4 (43)	109.4 (43)	109.4 (43)
	Domestic hot water - Waterside	Min	°F (°C)	77 (25)	77 (25)	77 (25)
		Max	°F (°C)	176 (80)	176 (80)	176 (80)
Sound Level (nominal) (1)	Heating	Sound Power	dBA	64	64	66
		Sound Pressure	dBA	51	51	52
	Cooling	Sound Power	dBA	65	66	69
		Sound Pressure	dBA	50	52	54

4-2 TECHNICAL SPECIFICATIONS				EBLQ036BA6VJU	EBLQ048BA6VJU	EBLQ054BA6VJU
Sound Level (Night quiet)	Heating	Sound Pressure	dBA	42	42	43
	Cooling	Sound Pressure	dBA	45	45	46
Refrigerant	Type			R-410A		
	Charge		lb (kg)	6.5 (2.95)	6.5 (2.95)	6.5 (2.95)
	Control			Electronic expansion valve		
	Nr of Circuits			1	1	1
Refrigerant Oil	Type			Daphne FVC68D		
	Charged Volume		oz (l)	34 oz (1.0 l)	34 oz (1.0 l)	34 oz (1.0 l)
Defrost Method				Pressure equalising		
Defrost Control				Sensor for outdoor heat exchanger temperature		
Capacity Control Method				Inverter controlled		
Safety Devices				High pressure switch		
				Fan motor thermal protector		
				Fuse		

Notes

(1) The sound pressure level is measured via a microphone at a certain distance from the unit. It is a relative value depending on the distance and acoustic environment. Refer to sound spectrum drawing for more information.

(2) 15°-25°C: BUH only, no heat pump operation = during commisioning

(3) Including piping + PHE + back-up heater / excluding expansion vessel

(4) E(D)(B)L* model can reach -4°F (-20°C)

4-3 MAIN COMPONENTS				EBLQ036BA6VJU	EBLQ048BA6VJU	EBLQ054BA6VJU
Air heat exchanger	Specifications	Length	in (mm)	33-3/4 (857)	33-3/4 (857)	33-3/4 (857)
		Nr of Rows		2	2	2
		Fin pitch	in (mm)	1/16 (1.4)	1/16 (1.4)	1/16 (1.4)
		Nr of Passes		5	5	5
		Face area	ft² (m²)	12.17 (1.131)	12.17 (1.131)	12.17 (1.131)
		Nr of Stages		60	60	60
	Tube type			Hi-XSS		
	Fin	Type		WF fin		
		Treatment		Anti-corrosion treatment (PE)		
Fan	Type			Propeller		
	Quantity			2	2	2
Air Flow Rate (nominal at 230V)	Heating	High	cfm (m³/min)	3178 (90)	3178 (90)	3178 (90)
	Cooling	High	cfm (m³/min)	3390 (96)	3531 (100)	3426 (97)
Fan	Discharge direction			Horizontal		
	Motor	Quantity		2	2	2
		Model		Brushless DC		
Motor	Speed (nominal)	Steps		8	8	8
		Heating	rpm	760	760	760
		Cooling	rpm	780	780	780
Fan	Motor	Output	W	70	70	70
		Drive		Direct drive		
Compressor	Quantity			1	1	1
	Motor	Model		JT100G-VD		
		Type		Hermetically sealed scroll compressor		
		Motor Output	W	2,200		
		Starting Method		Inverter driven		
Motor	Crankcase Heater	Output	W	33	33	33

4-3 MAIN COMPONENTS				EBLQ036BA6VJU	EBLQ048BA6VJU	EBLQ054BA6VJU
Pump	Type			Water cooled		
	Nr. of speed			2	2	2
	Nominal ESP unit	Heating	PSI (kPa)	7.61 (52.5)	6.31 (43.5)	5 (35)
		Cooling	PSI (kPa)	8.11 (55.9)	7.12 (49.1)	6.79 (46.8)
	Power input		W	210	210	210
Water side Heat exchanger	Type			Brazed plate		
	Quantity			1	1	1
	Water volume (3)		gal (l)	0.27 (1.01)	0.27 (1.01)	0.27 (1.01)
	Water flow rate Min.		gpm/min (l/min)	423 (16)	423 (16)	423 (16)
	Water flow rate Nom.	Heating	gpm/min (l/min)	848 (32.1)	10.49 (40.1)	12.13 (45.9)
		Cooling	gpm/min (l/min)	9.72 (36.8)	12.13 (45.9)	12.68 (48)
	Water flow rate Max.		gpm/min (l/min)	15.32 (58)	15.32 (58)	15.32 (58)
	Insulation material			Foamed synthetic elastomer		
Expansion vessel	Volume		gal (l)	2.64 (10)	2.64 (10)	2.64 (10)
	Maximum water pressure		PSI (bar)	43.5 (3)	43.5 (3)	43.5 (3)
	Pre pressure		PSI (bar)	14.5 (1.0)	14.5 (1.0)	14.5 (1.0)
Water filter	Diameter perforations		in (mm)	1/32 (1)	1/32 (1)	1/32 (1)
	Material			Brass		
Water circuit	Piping connections		inch	1-1/4 (MALE) BSP		
	Piping		inch	1-1/4		
	Safety valve		PSI (bar)	43.5 (3)	43.5 (3)	43.5 (3)
	Manometer			Yes		
	Drain valve / Fill valve			yes		
	Shut off valve			yes		
	Air purge valve			yes		
	Total water volume (3)		gal (l)	145 (5.5)	145 (5.5)	145 (5.5)

4-4 ELECTRICAL SPECIFICATIONS				EBLQ036BA6VJU	EBLQ048BA6VJU	EBLQ054BA6VJU
Power supply compressor component	Main Power	Name		VJ		
		Phase		1	1	1
		Frequency	Hz	60	60	60
		Voltage	V	208/230	208/230	208/230
	Voltage range	Minimum	V	-10%		
		Maximum	V	+10%		
	Current	Rated Load Amps (RLA)	A	23.4	23.4	23.4
		Full Load Amps (FLA)	A	26.5	26.5	26.5
		MCA	A	26.5	26.5	26.5
		MOP	A	30	30	30
	Wiring connections	For power supply compressor component		Installation Instruction		
Power supply hydraulic component	Current back-up heater	Type		Electric 6kW		
Current back-up heater	Power Supply	Phase		1~		
		Frequency	Hz	60	60	60
		Voltage	V	208/230	208/230	208/230
	Current	Minimum Circuit Amps (MCA)	A	28.6	28.6	28.6
		Maximum Overcurrent Protection (MOP)	A	30	30	30

4-4 ELECTRICAL SPECIFICATIONS				EBLQ036BA6VJU	EBLQ048BA6VJU	EBLQ054BA6VJU
Power supply hydronic component	Voltage range	Minimum	V	-10%		
		Maximum	V	+10%		
	Wiring connections	Connection type		for power supply hydraulic compartment		
		Quantity of wires		3G		
		Type of wires		Select diameter and type according to national and local regulations		
		Connection type		for power supply connection to optional sanitary tank + Q2L		
		Quantity of wires		3G		
		Type of wires		Select diameter and type according to national and local regulations		
		Type of wires		For more details on voltage range and current refer to installation manual		
		Connection type		for connection with R5T		
		Quantity of wires		Wire included in option EKHWS*		
		Type of wires		Wire included in option EKHWS*		
		Connection type		for connection with A3P		
		Quantity of wires		Depends on thermostat type, refer to installation manual		
		Type of wires		Select diameter and type according to national and local regulations		
		Type of wires		For more details on voltage range and current refer to installation manual.		
		Connection type		for connection with M2S		
		Quantity of wires		3G		
		Type of wires		Select diameter and type according to national and local regulations		
		Type of wires		For more details on voltage range and current refer to installation manual.		
		Connection type		for connection with M3S		
		Quantity of wires		3G or 4G		
		Type of wires		Select diameter and type according to national and local regulations		
		Type of wires		For more details on voltage range and current refer to installation manual.		
	Notes			Power supply compressor compartment is for compressor, fan, pump and controller		
				Installer can reduce capacity of the heater from 20,491 to 10,245 BTU/hr (6 to 3kW). The current is then reduced from 26 to 13A. Instructions see installation manual.		
				Installer can reduce capacity of the heater from 6 to 3.5kW. The current is then reduced from 8.7 to 5A. Instructions see installation manual.		
				Power supply hydraulic compartment is for the electric heater. The optional domestic warm water tank has a separate power supply.		
				Standard for safety heating & cooling equipment; UL1995 / CSA (U&C) C22.2 #236		

5. Capacity Tables – EBLQ – Heating

MAXIMUM HEATING CAPACITY - PEAK VALUE

MODEL	LWC (°F/°C)	86/30			95/35			104/40			113/45			122/50			131/55		
	T_{amb} (°F/°C)	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	
E(D/B)LQ036BA6VJU	-4/-20	20.00	7.93	**2.52**	18.81	8.63	**2.18**												
	5/-15	22.61	8.04	**2.81**	21.25	8.76	**2.43**	20.78	9.61	**2.16**									
	19/-7.2	27.75	8.12	**3.42**	26.15	8.68	**3.01**	25.02	9.77	**2.56**	24.96	11.34	**2.20**						
	25/-3.9	31.66	8.12	**3.90**	29.90	8.90	**3.36**	29.38	9.81	**2.99**	28.70	11.41	**2.52**	27.66	12.65	**2.19**			
	36/2.2	35.22	8.08	**4.36**	33.34	8.89	**3.75**	32.83	9.82	**3.34**	32.15	11.43	**2.81**	31.06	12.69	**2.45**	29.02	14.10	**2.06**
	45/7.2	40.25	8.02	**5.02**	39.21	8.84	**4.44**	37.74	9.79	**3.85**	37.07	11.42	**3.25**	35.94	12.71	**2.83**	33.71	14.13	**2.39**
	54/12.2	43.65	7.80	**5.60**	41.57	8.62	**4.82**	41.17	9.58	**4.30**	40.57	11.21	**3.62**	39.47	12.50	**3.16**	37.16	13.92	**2.67**
	59/15	47.22	7.72	**6.12**	45.03	8.55	**5.27**	44.69	9.52	**4.69**	44.11	11.16	**3.95**	43.00	12.46	**3.45**	40.57	13.89	**2.92**
	68/20	53.68	7.58	**7.08**	51.33	8.41	**6.10**	51.07	9.40	**5.43**	50.57	11.06	**4.57**	45.01	12.36	**3.64**	45.45	13.81	**3.29**
E(D/B)LQ048BA6VJU	-4/-20	25.32	9.95	**2.54**	24.58	10.82	**2.27**												
	5/-15	28.29	10.15	**2.79**	27.29	11.03	**2.47**	26.34	12.07	**2.18**									
	19/-7.2	34.37	10.35	**3.32**	33.00	11.28	**2.93**	31.66	12.36	**2.56**	30.96	13.42	**2.31**						
	25/-3.9	39.11	10.44	**3.75**	37.52	11.39	**3.29**	35.95	12.49	**2.88**	35.11	13.58	**2.59**	34.57	14.97	**2.31**			
	36/2.2	43.50	10.48	**4.15**	41.72	11.45	**3.64**	39.98	12.57	**3.18**	39.02	13.67	**2.85**	38.40	15.08	**2.55**	36.62	16.64	**2.20**
	45/7.2	49.77	10.52	**4.73**	47.77	11.37	**4.20**	45.79	12.55	**3.65**	44.70	13.77	**3.25**	43.99	15.20	**2.89**	41.96	16.75	**2.51**
	54/12.2	52.69	10.21	**5.16**	50.62	11.18	**4.53**	48.57	12.31	**3.95**	47.45	13.42	**3.54**	46.73	14.83	**3.15**	44.60	16.38	**2.72**
	59/15	57.09	10.21	**5.59**	54.90	11.19	**4.91**	52.71	12.32	**4.28**	51.53	13.44	**3.83**	50.78	14.86	**3.42**	48.50	16.42	**2.95**
	68/20	65.14	10.22	**6.37**	62.72	11.20	**5.60**	60.30	12.34	**4.89**	59.03	13.47	**4.38**	50.58	14.89	**3.40**	54.08	16.46	**3.29**
E(D/B)LQ054BA6VJU	-4/-20	28.90	11.60	**2.49**	28.45	12.59	**2.26**												
	5/-15	32.20	11.83	**2.72**	31.42	12.86	**2.44**	30.68	14.05	**2.18**									
	19/-7.2	39.03	12.12	**3.22**	37.80	13.19	**2.87**	36.60	14.44	**2.53**	35.94	15.69	**2.29**						
	25/-3.9	44.41	12.27	**3.62**	42.91	13.36	**3.21**	41.43	14.83	**2.79**	40.58	15.91	**2.55**	39.07	17.52	**2.23**			
	36/2.2	49.40	12.37	**3.99**	47.69	13.48	**3.54**	45.99	14.77	**3.11**	44.96	16.05	**2.80**	43.24	17.68	**2.45**	41.51	19.49	**2.13**
	45/7.2	56.57	12.49	**4.53**	54.59	13.42	**4.07**	52.61	14.92	**3.53**	51.39	16.22	**3.17**	49.37	17.86	**2.76**	47.34	19.69	**2.40**
	54/12.2	58.99	12.18	**4.84**	56.94	13.28	**4.29**	54.88	14.57	**3.77**	53.60	15.85	**3.38**	51.48	17.46	**2.95**	49.35	19.25	**2.56**
	59/15	63.98	12.24	**5.23**	61.77	13.35	**4.63**	59.55	14.63	**4.07**	58.18	15.92	**3.65**	55.09	17.54	**3.14**	53.59	19.33	**2.77**
	68/20	73.10	12.37	**5.91**	70.64	13.47	**5.24**	68.16	14.76	**4.62**	66.63	16.06	**4.15**	64.05	17.68	**3.62**	61.45	19.47	**3.16**

Peak value does not include capacity drop during frosting and defrosting periods.

MAXIMUM HEATING CAPACITY - INTEGRATED VALUE

MODEL	LWC (°F/°C)	86/30			95/35			104/40			113/45			122/50			131/55		
	T_{amb} (°F/°C)	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP	HC kBTU/h	PI (kBTU/h)	COP
E(D/B)LQ036BA6VJU	-4/-20	16.93	7.81	**2.17**	15.92	8.49	**1.88**												
	5/-15	19.14	7.91	**2.42**	17.99	8.62	**2.09**	17.59	9.45	**1.86**									
	19/-7.2	23.49	7.99	**2.94**	22.14	8.74	**2.53**	21.69	9.81	**2.21**	21.13	11.14	**1.90**						
	25/-3.9	26.27	7.84	**3.35**	24.82	8.60	**2.89**	24.38	9.47	**2.57**	23.82	11.00	**2.17**	22.95	12.20	**1.88**			
	36/2.2	29.23	7.81	**3.74**	27.67	8.58	**3.22**	27.25	9.47	**2.88**	26.88	11.02	**2.44**	25.78	12.23	**2.11**	24.09	13.59	**1.77**
	45/7.2	40.25	8.02	**5.02**	38.21	8.64	**4.42**	37.74	9.79	**3.85**	37.07	11.42	**3.25**	35.94	12.71	**2.83**	33.71	14.13	**2.39**
	54/12.2	43.66	7.80	**5.60**	41.57	8.62	**4.82**	41.17	9.58	**4.30**	40.57	11.21	**3.62**	39.47	12.50	**3.16**	37.16	13.92	**2.67**
	59/15	47.22	7.72	**6.12**	45.03	8.55	**5.27**	44.59	9.52	**4.68**	44.11	11.16	**3.95**	43.00	12.46	**3.45**	40.57	13.80	**2.94**
	68/20	53.68	7.58	**7.08**	51.33	8.41	**6.10**	51.07	9.40	**5.43**	50.57	11.06	**4.57**	48.01	12.36	**3.88**	45.45	13.81	**3.29**
E(D/B)LQ048BA6VJU	-4/-20	21.54	9.69	**2.22**	20.91	10.52	**1.99**												
	5/-15	24.07	9.87	**2.44**	23.21	10.73	**2.16**	22.40	11.73	**1.91**									
	19/-7.2	29.24	10.06	**2.91**	28.07	10.96	**2.56**	26.93	12.01	**2.24**	26.34	13.04	**2.02**						
	25/-3.9	31.09	9.51	**3.27**	29.83	10.37	**2.88**	28.58	11.30	**2.53**	27.91	12.36	**2.26**	27.48	13.62	**2.02**			
	36/2.2	34.58	9.53	**3.63**	33.17	10.42	**3.18**	31.78	11.44	**2.78**	31.02	12.44	**2.49**	30.52	13.71	**2.23**	29.12	15.13	**1.92**
	45/7.2	49.77	10.52	**4.73**	47.77	11.37	**4.20**	45.79	12.65	**3.62**	44.70	13.77	**3.25**	43.99	15.20	**2.89**	41.96	16.78	**2.50**
	54/12.2	52.69	10.21	**5.16**	50.02	11.18	**4.47**	48.57	12.31	**3.95**	47.45	13.42	**3.54**	46.73	14.83	**3.15**	44.60	16.38	**2.72**
	59/15	57.09	10.21	**5.59**	54.90	11.19	**4.91**	52.71	12.32	**4.28**	51.53	13.44	**3.83**	50.78	14.86	**3.42**	48.50	16.42	**2.95**
	68/20	65.14	10.22	**6.37**	62.72	11.20	**5.60**	60.30	12.34	**4.89**	59.03	13.47	**4.38**	56.58	14.89	**3.80**	54.08	16.46	**3.29**
E(D/B)LQ054BA6VJU	-4/-20	23.88	11.30	**2.11**	23.50	12.26	**1.92**												
	5/-15	26.60	11.52	**2.31**	25.96	12.52	**2.07**	25.35	13.69	**1.85**									
	19/-7.2	32.25	11.79	**2.74**	31.23	12.83	**2.43**	30.24	14.05	**2.15**	29.69	15.26	**1.95**						
	25/-3.9	33.97	10.97	**3.10**	32.63	11.95	**2.73**	31.70	13.09	**2.42**	31.03	14.23	**2.18**	29.89	15.67	**1.91**			
	36/2.2	37.79	11.04	**3.42**	36.48	12.03	**3.03**	35.19	13.19	**2.67**	34.40	14.34	**2.40**	33.08	15.80	**2.09**	31.75	17.42	**1.82**
	45/7.2	56.57	12.49	**4.53**	54.59	13.42	**4.07**	52.61	14.92	**3.53**	51.39	16.22	**3.17**	49.37	17.86	**2.76**	47.34	19.59	**2.42**
	54/12.2	58.99	12.18	**4.84**	58.94	13.26	**4.44**	54.88	14.57	**3.77**	53.60	15.85	**3.38**	51.46	17.46	**2.95**	49.35	19.25	**2.56**
	59/15	63.98	12.24	**5.23**	61.77	13.35	**4.63**	59.55	14.63	**4.07**	58.18	15.92	**3.65**	55.89	17.54	**3.19**	53.59	19.33	**2.77**
	68/20	73.10	12.37	**5.91**	70.64	13.47	**5.24**	68.15	14.76	**4.62**	66.63	16.06	**4.15**	64.05	17.68	**3.62**	61.45	19.47	**3.16**

Integrated value takes into consideration the capacity drop during frosting and defrosting periods.

6. Capacity Tables – EBLQ – Cooling

MAXIMUM COOLING CAPACITY

MODEL	T_{amb} (°F/°C)	60/15.6			77/25			86/30			95/35			104/40			113/45		
	LWE (°F/°C)	CC kBTU/h	PI (kW)	EER	CC kBTU/h	PI (kW)	EER	CC kBTU/h	PI (kW)	EER	CC kBTU/h	PI (kW)	EER	CC kBTU/h	PI (kW)	EER	CC kBTU/h	PI (kW)	EER
EBLQ036BA6VJU	45/7.2	37.81	2.83	**13.36**	37.49	3.09	**12.13**	36.23	3.39	**10.69**	34.12	3.72	**9.17**	31.27	4.10	**7.63**	27.79	4.51	**6.16**
	50/10	40.16	2.86	**14.04**	39.80	3.13	**12.72**	38.45	3.43	**11.21**	38.21	3.77	**10.14**	33.19	4.15	**8.00**	29.52	4.57	**6.46**
	55/12.8	44.13	2.88	**15.32**	43.72	3.16	**13.84**	42.24	3.47	**12.17**	39.79	3.82	**10.42**	36.50	4.21	**8.67**	32.03	4.78	**6.70**
	59/15	46.87	2.91	**16.11**	46.44	3.19	**14.56**	44.87	3.51	**12.78**	42.28	3.86	**10.95**	38.80	4.24	**9.15**	33.19	4.65	**7.14**
	64/17.8	51.75	2.94	**17.60**	50.01	3.23	**15.48**	47.33	3.55	**13.33**	43.83	3.91	**11.21**	39.61	4.30	**9.21**	33.60	4.31	**7.80**
	72/22.2	57.72	3.00	**19.24**	55.81	3.29	**16.96**	52.86	3.62	**14.60**	49.00	3.98	**12.31**	44.36	4.38	**10.13**	35.22	3.86	**9.12**
EBLQ048BA6VJU	45/7.2	47.31	4.14	**11.43**	46.93	4.51	**10.41**	45.34	4.94	**9.18**	42.65	5.42	**7.87**	37.82	5.20	**7.27**	33.48	5.73	**5.84**
	50/10	50.90	4.22	**12.06**	50.46	4.60	**10.97**	48.73	5.03	**9.69**	45.84	5.52	**8.30**	40.68	5.29	**7.69**	36.03	5.82	**6.19**
	55/12.8	55.89	4.30	**13.00**	55.39	4.69	**11.81**	53.49	5.13	**10.43**	50.32	5.62	**8.95**	44.68	5.38	**8.30**	37.38	5.90	**6.34**
	59/15	59.32	4.35	**13.64**	58.78	4.75	**12.37**	56.77	5.20	**10.92**	53.44	5.69	**9.39**	47.47	5.45	**8.71**	38.74	5.76	**6.73**
	64/17.8	64.55	4.45	**14.51**	62.37	4.85	**12.86**	59.01	5.29	**11.16**	54.57	5.79	**9.42**	47.75	5.54	**8.62**	39.21	5.33	**7.36**
	72/22.2	71.89	4.59	**15.66**	69.50	5.00	**13.90**	65.80	5.45	**12.07**	60.92	5.95	**10.24**	53.38	5.68	**9.40**	41.10	4.76	**8.63**
EBLQ054BA6VJU	45/7.2	49.55	4.58	**10.82**	49.27	5.00	**9.85**	47.61	5.46	**8.72**	44.70	5.97	**7.49**	39.46	5.70	**6.92**	33.57	5.60	**5.99**
	50/10	53.38	4.68	**11.41**	52.99	5.11	**10.37**	51.15	5.58	**9.17**	48.01	6.09	**7.88**	42.40	5.81	**7.30**	36.12	5.69	**6.35**
	55/12.8	58.66	4.79	**12.25**	58.17	5.23	**11.12**	56.13	5.70	**9.85**	52.68	6.22	**8.47**	46.56	5.92	**7.86**	37.47	5.77	**6.49**
	59/15	62.29	4.87	**12.79**	61.74	5.31	**11.63**	59.56	5.78	**10.30**	55.91	6.30	**8.87**	49.45	5.99	**8.26**	38.83	5.63	**6.90**
	64/17.8	67.80	5.00	**13.56**	65.51	5.43	**12.06**	61.83	5.91	**10.46**	57.07	6.43	**8.88**	49.72	6.10	**8.15**	39.30	5.21	**7.54**
	72/22.2	75.53	5.19	**14.55**	72.97	5.63	**12.96**	68.95	6.10	**11.30**	63.66	6.62	**9.62**	55.55	6.28	**8.85**	41.20	4.60	**8.96**

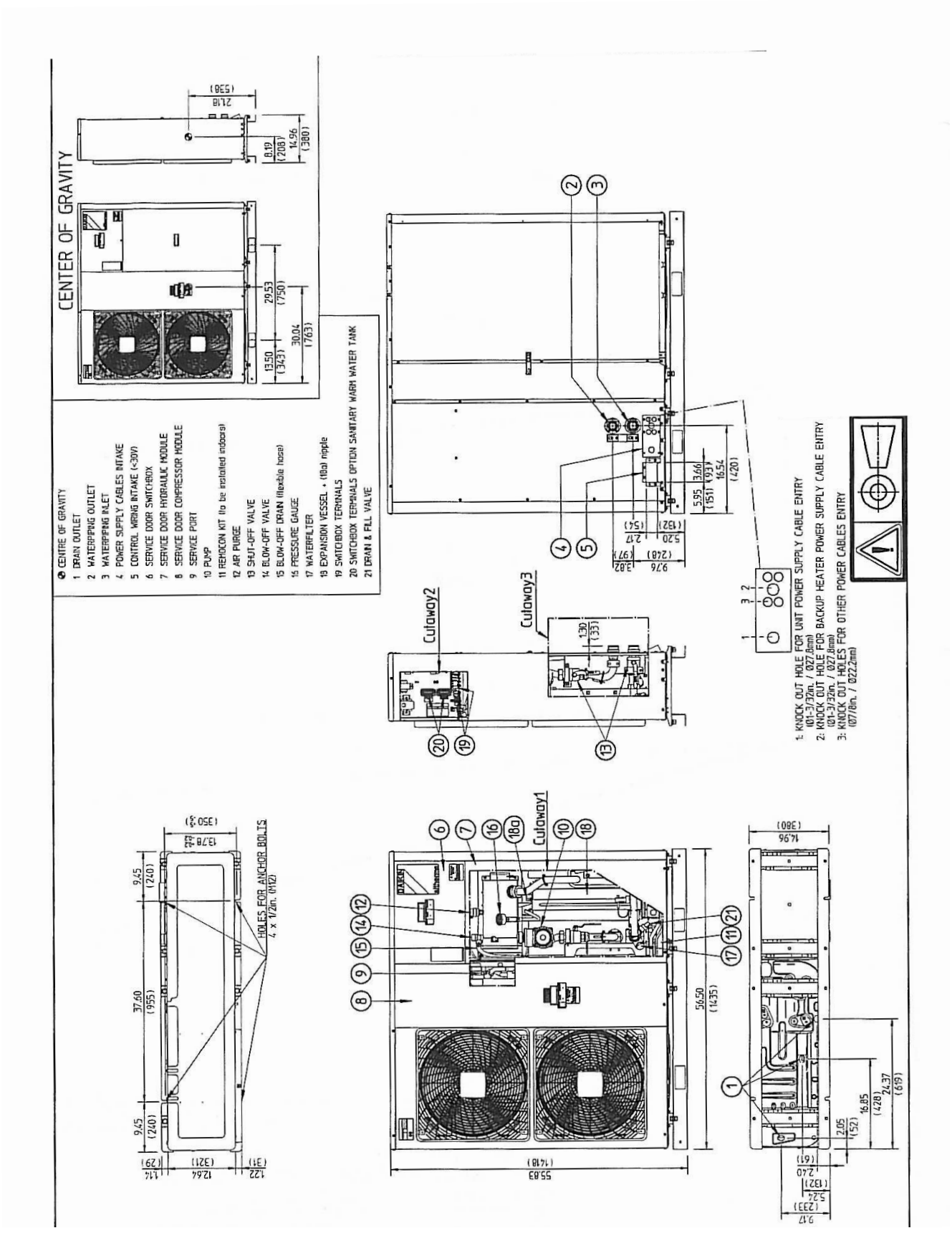
Symbols:

CC Cooling Capacity @ maximum operating frequency, BTU/h
HC Heating Capacity @ maximum operating frequency, BTU/h
PI Cooling Power Input (kW), Heating Power Input (kBTU/h measured according to Eurovent 6/C003-2006 (kW)/EN14511
LWE Leaving Water evaporator temperature (Cooling)
LWC Leaving Water condenser temperature (Heating)
Tamb Outdoor Ambient temperature, RH = 85%

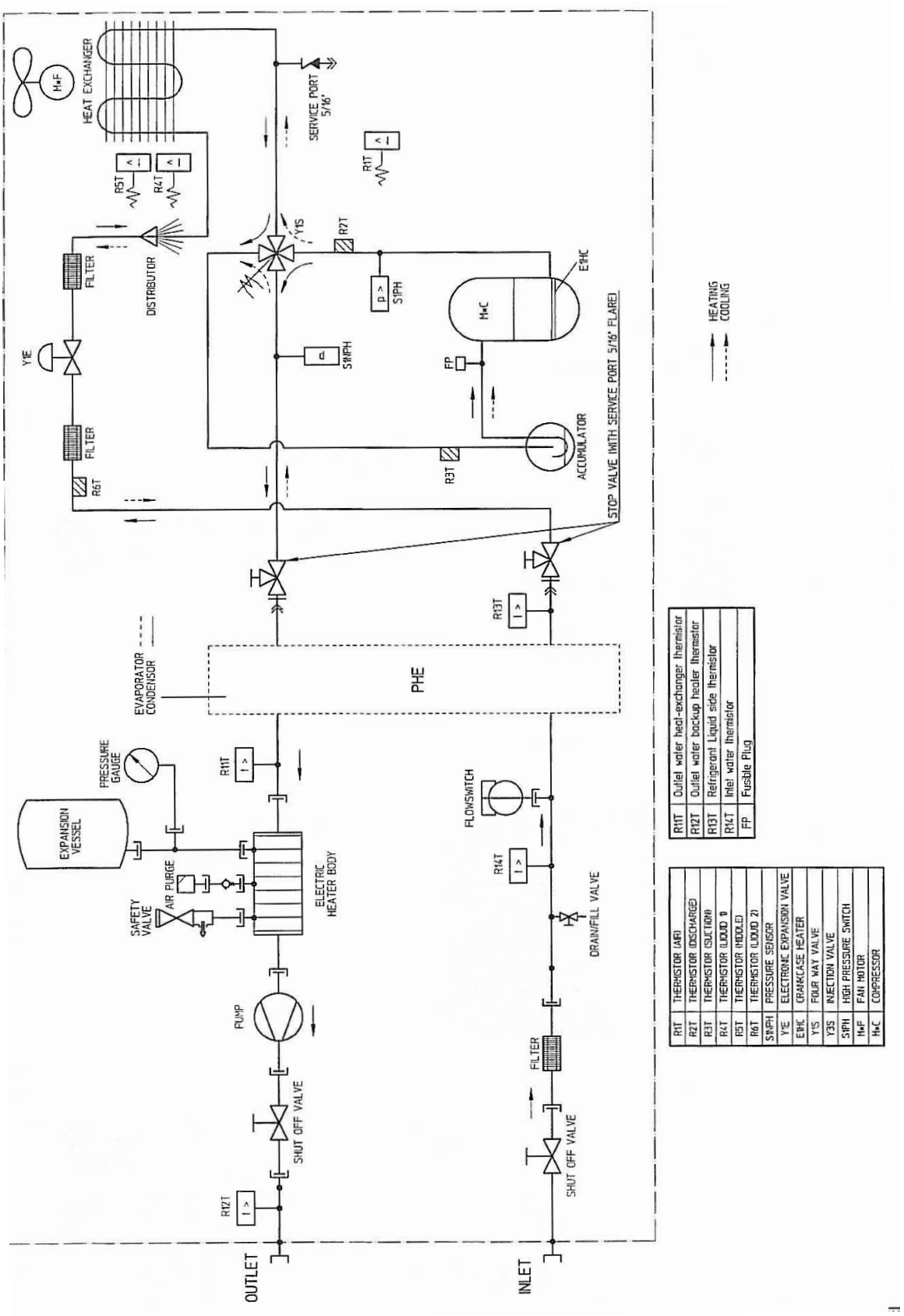
Conditions:

Cooling Capacity BTU/h and valid for chilled water range ΔT = 5-15^{0}F (3-8^{0}C)
Heating Capacity is according to Eurovent 6/C/003-2006 (kW) and valid for heating water range ΔT = 5-15^{0}F (3-8^{0}C)
Power Input is total of indoor and outdoor unit, except the circulation pump; (90W per EN14511)

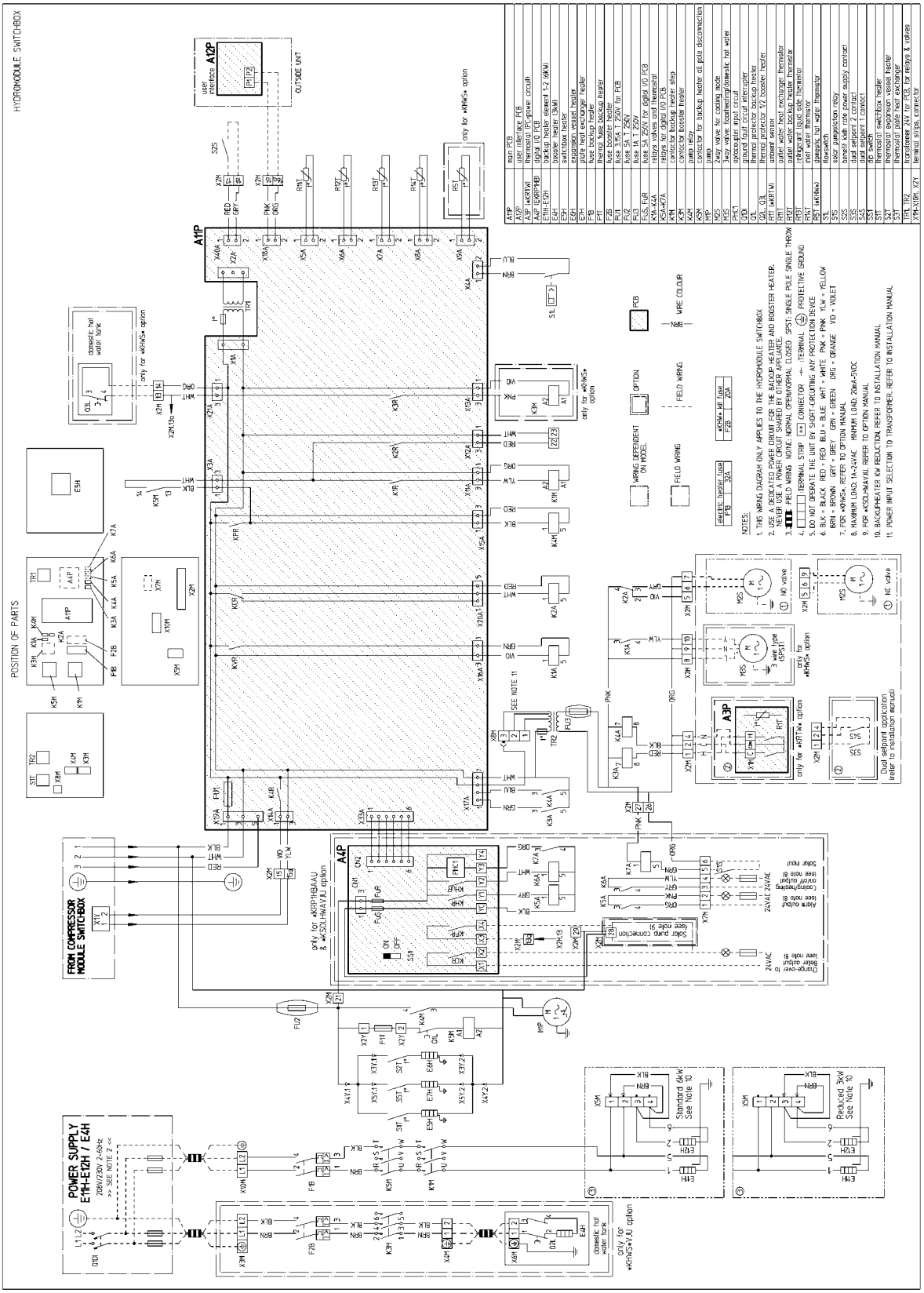
7. Dimensional Drwg. & Center of Gravity - Monobloc


CENTER OF GRAVITY
CENTRE OF GRAVITY
1 DRAIN OUTLET
2 WATERPIPING OUTLET
3 WATERPIPING INLET
4 POWER SUPPLY CABLES INTAKE
5 CONTROL WIRING INTAKE (<30V)
6 SERVICE DOOR SWITCHBOX
7 SERVICE DOOR HYDRAULIC MODULE
8 SERVICE DOOR COMPRESSOR MODULE
9 SERVICE PORT
10 PUMP
11 REMOCON KIT (to be installed indoors)
12 AIR PURGE
13 SHUT-OFF VALVE
14 BLOW-OFF VALVE
15 BLOW-OFF DRAIN (flexible hose)
16 PRESSURE GAUGE
17 WATERFILTER
18 EXPANSION VESSEL + (18a) nipple
19 SWITCHBOX TERMINALS
20 SWITCHBOX TERMINALS (OPTION SANITARY WARM WATER TANK
21 DRAIN & FILL VALVE
Culaway1
Culaway2
Culaway3
1: KNOCK OUT HOLE FOR UNIT POWER SUPPLY CABLE ENTRY
(Ø1-3/32in. / Ø27.8mm)
2: KNOCK OUT HOLE FOR BACKUP HEATER POWER SUPPLY CABLE ENTRY
(Ø1-3/32in. / Ø27.8mm)
3: KNOCK OUT HOLES FOR OTHER POWER CABLES ENTRY
(Ø7/8in. / Ø22.2mm)
HOLES FOR ANCHOR BOLTS
4 x 1/2in. (M12)

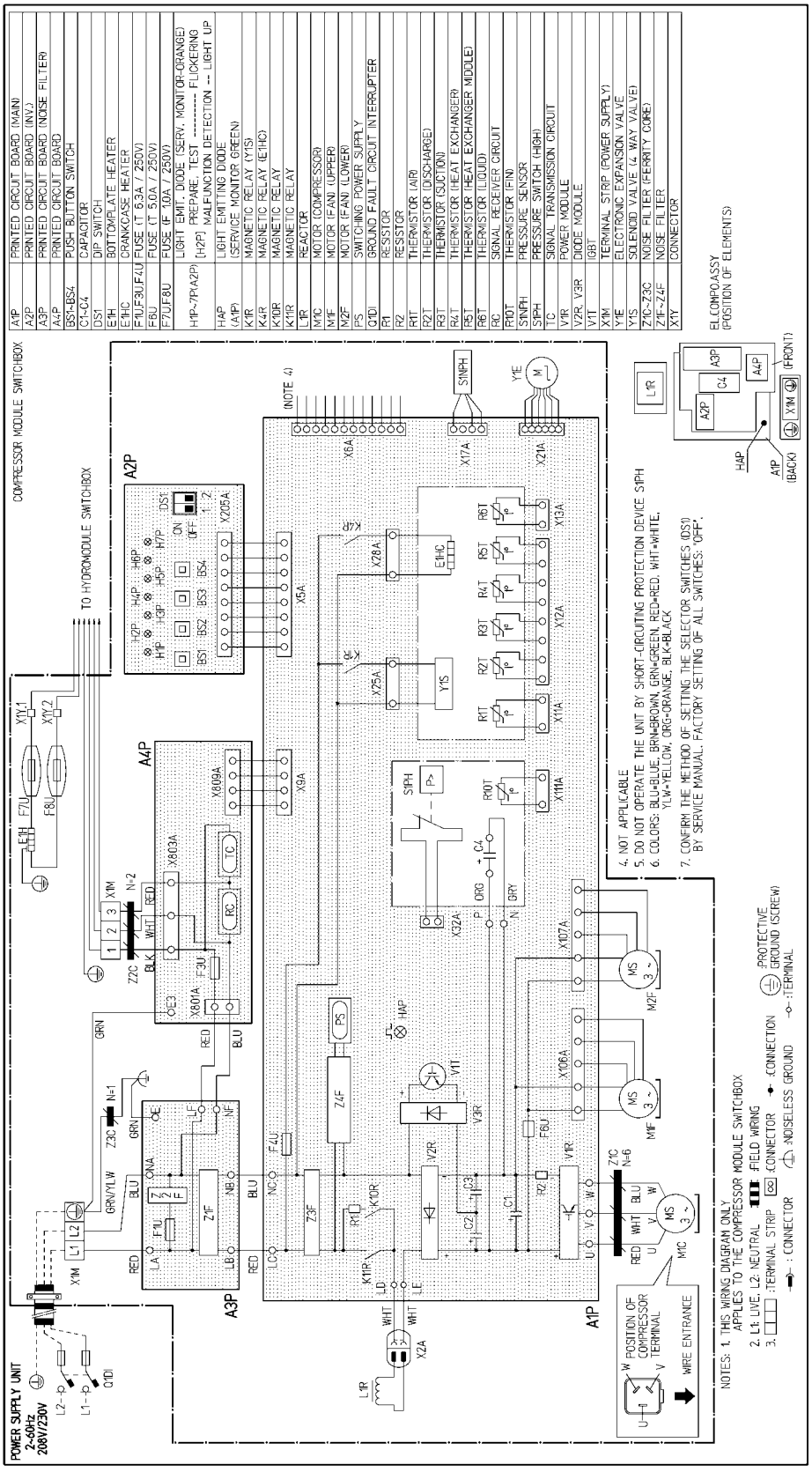
8. Piping Diagram - Monobloc



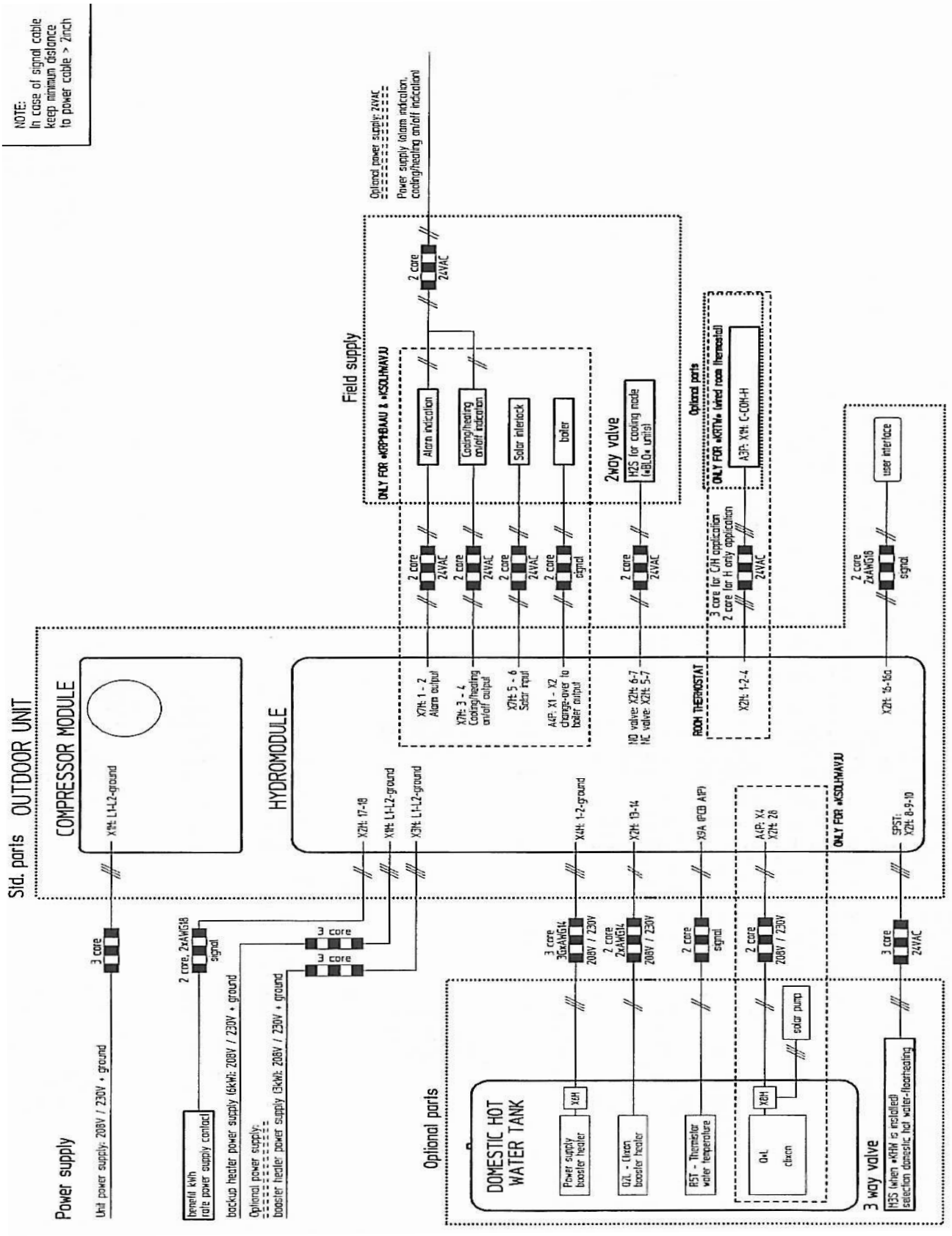
9. Wiring Diagram - Monobloc


HYDRONODULE SWITCHBOX
POSITION OF PARTS
A1P main PCB
A2P user interface PCB
A3P backup heater power circuit
E1H-E2H backup I/O PCB
E4H booster heater (3kW)
E5H switchbox heater
E6H expansion vessel heater
E7H domestic hot water tank heater
FIB fuse backup heater
FU1 thermal type backup heater
FU2 fuse booster heater
FU3 fuse 3.15A T 250V for PCB
FU5 fuse 4A T 250V
FU6, FU8 fuse 5A 250V for digital I/O PCB
K1R, K4A relays valves and thermostat
K5A-K7A relays for digital I/O PCB
K2M contactor backup heater step
K3M contactor booster heater
K4M pump relay
K5M contactor for backup heater all pole disconnection
M1P pump
M2S 2way valve for cooling mode
M3S 3way valve (tank/heating/domestic hot water
PHC1 pump inverter circuit
Q1D ground fault circuit interrupter
Q1L thermal protector backup heater
Q2L, Q3L thermal protector 1/2 booster heater
R1T, ×R1T(W) ambient sensor
R2T outlet water 1 backup heater thermistor
R3T outlet water backup heater thermistor
R4T refrigerant liquid side thermistor
R5T inlet water thermistor
R6T, ×R7W× domestic hot water thermistor
S1L flowswitch
S1S, S2S power consumption relay
S2S, S3S benefit kWh rate power supply contact
S3S, S4S dual setpoint 2 contact
S4S, S5S dual setpoint 1 contact
S1S, S2S dip switch
S1ST thermostat backup heater
S2T thermostat expansion vessel heater
S3T thermostat plate heat exchanger
TR1, TR2 transformer 2kV for PCB, for relays & valves
X1M, X2M, X3M terminal strips, connector
NOTES:
1. THIS WIRING DIAGRAM ONLY APPLIES TO THE HYDRONODULE SWITCHBOX
2. USE A DEDICATED POWER CIRCUIT FOR THE BACKUP HEATER AND BOOSTER HEATER.
3. FIELD WIRING NOTE: NORMAL OPEN/NORMAL CLOSED SPST, SINGLE POLE SINGLE THROW
4. TERMINAL STRIP CONNECTOR TERMINAL PROTECTIVE GROUND
5. DO NOT OPERATE THE UNIT BY SHORT-CIRCUITING ANY PROTECTION DEVICE
6. BLK = BLACK RED = RED BLU = BLUE WHT = WHITE PNK = PINK YLW = YELLOW BRN = BROWN GRY = GREY GRN = GRANGE ORG = ORANGE VIO = VIOLET
7. FOR ×KHW×, REFER TO OPTION MANUAL
8. MAXIMUM LOAD: 1A-24VAC MINIMUM LOAD: 20mA-5VDC
9. FOR ×KSOLHWAV1U, REFER TO OPTION MANUAL
10. BACKUPHEATER KW REDUCTION, REFER TO INSTALLATION MANUAL
11. POWER INPUT SELECTION TO TRANSFORMER, REFER TO INSTALLATION MANUAL
FROM COMPRESSOR MODULE SWITCHBOX
POWER SUPPLY E1H-E2H / E4H
208V/230V 2.45Hz
SEE NOTE 2
Standard 6kW See Note 10
Reduced 3kW See Note 10
only for ×KHW×V1U option
only for ×KRP1HBAAU & ×KSOLHWAV1U option
only for ×KHW× option
only for ×KHW× kit fuse
WIRE COLOUR
FIELD WIRING
WRING DEPENDENT ON MODEL
OPTION
PCB
Dual setpoint application (refer to installation manual)
Alarm output (see note 8)
Solar input
Booster output (see note 8)
Tank-over to (see note 8)
3 wire type (SPST)
NO valve
NC valve
SEE NOTE 11
SEE NOTE 9

9.1 Wiring Diagram

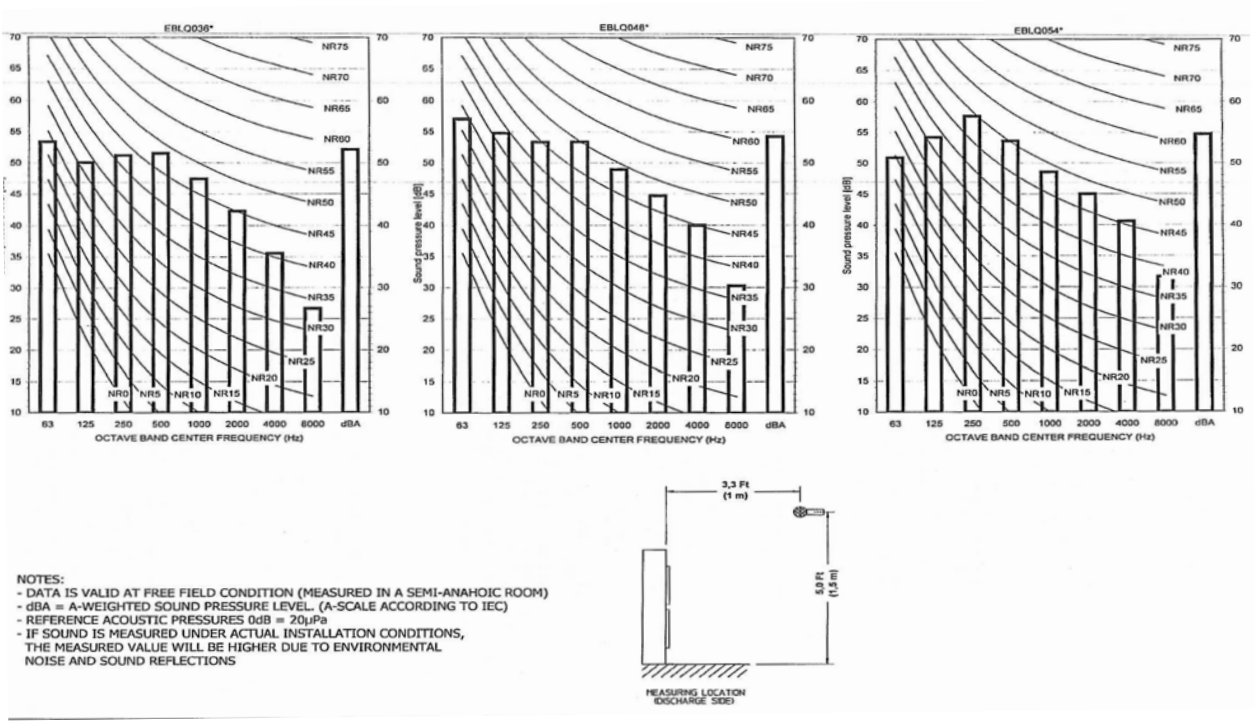

A1P PRINTED CIRCUIT BOARD (MAIN)
A2P PRINTED CIRCUIT BOARD (INV.)
A3P PRINTED CIRCUIT BOARD (NOISE FILTER)
A4P PRINTED CIRCUIT BOARD
BS1-BS4 PUSH BUTTON SWITCH
C1-C4 CAPACITOR
DS1 DIP SWITCH
E1H BOTTOMPLATE HEATER
E1HC CRANKCASE HEATER
F1U,F3U,F4U FUSE (T 6.3A / 250V)
F5U FUSE (T 5.0A / 250V)
F7U,F8U FUSE (F 10A / 250V)
H1P~7P,H2P(R) LIGHT EMIT. DIODE (SERV. MONITOR-ORANGE)
H2P(J) PREPARE, TEST --------- FLICKERING
MALFUNCTION DETECTION -- LIGHT UP
HAP LIGHT EMITTING DIODE
(A1P) (SERVICE MONITOR, GREEN)
K1R MAGNETIC RELAY (Y1S)
K4R MAGNETIC RELAY (E1HC)
K10R MAGNETIC RELAY
K7R MAGNETIC RELAY
L1R REACTOR
M1C MOTOR (COMPRESSOR)
M1F MOTOR (FAN) (UPPER)
M2F MOTOR (FAN) (LOWER)
PS SWITCHING POWER SUPPLY
Q1DI GROUND FAULT CIRCUIT INTERRUPTER
R1 RESISTOR
R2 RESISTOR
R1T THERMISTOR (AIR)
R2T THERMISTOR (DISCHARGE)
R3T THERMISTOR (SUCTION)
R4T THERMISTOR (HEAT EXCHANGER)
R5T THERMISTOR (HEAT EXCHANGER MIDDLE)
R6T THERMISTOR (LIQUID)
RC SIGNAL RECEIVER CIRCUIT
R10T THERMISTOR (FIN)
S1NPH PRESSURE SENSOR
S1PH PRESSURE SWITCH (HIGH)
TC SIGNAL TRANSMISSION CIRCUIT
V1R POWER MODULE
V2R, V3R DIODE MODULE
V1T IGBT
X1M TERMINAL STRIP (POWER SUPPLY)
Y1E ELECTRONIC EXPANSION VALVE
Y1S SOLENOID VALVE (4 WAY VALVE)
Z1C-Z3C NOISE FILTER (FERRITE CORE)
Z1F-Z4F NOISE FILTER
X1Y CONNECTOR
ELCOMPO.ASSY (POSITION OF ELEMENTS)
POWER SUPPLY UNIT 2~60Hz 208V/230V
COMPRESSOR MODULE SWITCHBOX
TO HYDROMODULE SWITCHBOX
A1P
A2P
A3P
A4P
NOTES: 1. THIS WIRING DIAGRAM ONLY APPLIES TO THE COMPRESSOR MODULE SWITCHBOX
2. L1: LIVE, L2: NEUTRAL
3. : TERMINAL STRIP
: FIELD WIRING
: CONNECTOR
: CONNECTION
: NOISELESS GROUND
: PROTECTIVE GROUND (SCREW)
: TERMINAL
: CONNECTOR
4. NOT APPLICABLE
5. DO NOT OPERATE THE UNIT BY SHORT-CIRCUITING PROTECTION DEVICE S1PH
6. COLORS: BLU=BLUE, BRN=BROWN, GRN=GREEN, RED=RED, WHT=WHITE, YLW=YELLOW, ORG=ORANGE, BLK=BLACK
7. CONFIRM THE METHOD OF SETTING THE SELECTOR SWITCHES (DS1) BY SERVICE MANUAL. FACTORY SETTING OF ALL SWITCHES: "OFF".
POSITION OF COMPRESSOR TERMINAL
WIRE ENTRANCE
(NOTE 4)
(FRONT)
(BACK)

9.2 External Connection Diagram - Monobloc

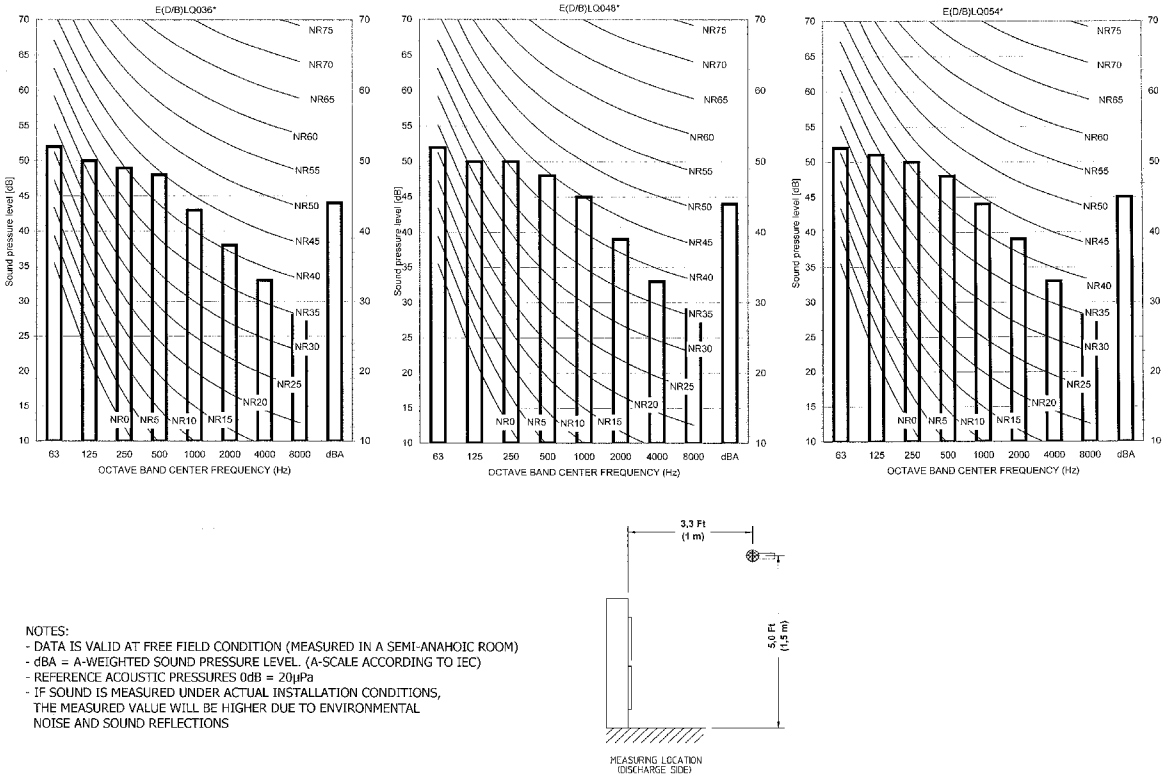


10. Sound Data - Monobloc

10.1 Sound Pressure Spectrum - Normal Operation



10.2 Sound Pressure Night Quiet Mode



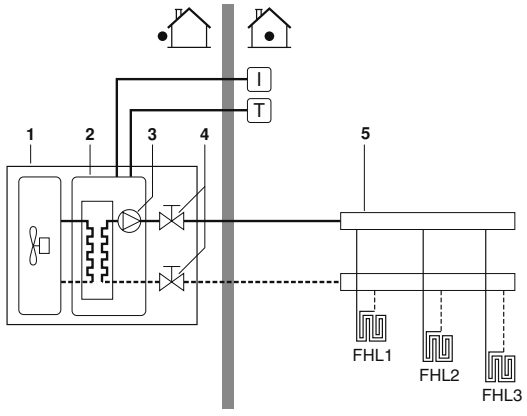
11. Application Examples - Monobloc

TYPICAL APPLICATION EXAMPLES

The application examples given below are for illustration purposes only.

Application 1

Space heating only application with a room thermostat connected to the unit.



1	Unit	**FHL1..3**	Floor heating loop (field supply)
2	Heat exchanger		
3	Pump	**T**	Room thermostat (optional)
4	Shut-off valve		
5	Collector (field supply)	**I**	User interface

Unit operation and space heating

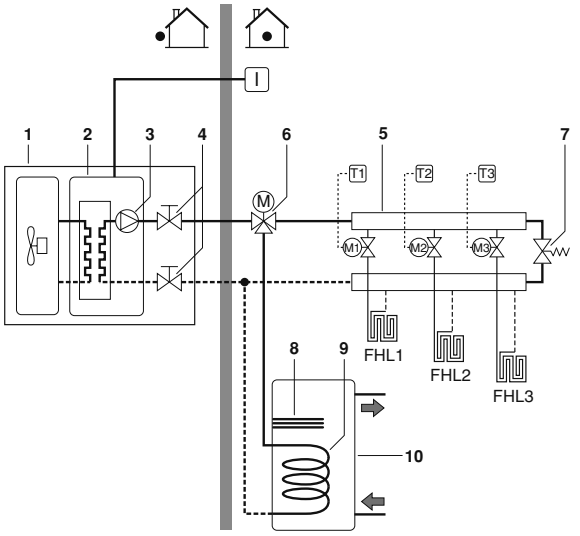
When a room thermostat (T) is connected to the unit and when there is a heating request from the room thermostat, the unit will start operating to achieve the target leaving water temperature as set on the user interface.

When the room temperature is above the thermostat set point, the unit will stop operating.

Make sure to connect the thermostat wires to the correct terminals (see "Connection of the thermostat cable" on page 20) and to configure the DIP switch toggle switches correctly (see "Room thermostat installation configuration" on page 23).

Application 2

Space heating only application without room thermostat connected to the unit. The temperature in each room is controlled by a valve on each water circuit. Domestic hot water is provided through the domestic hot water tank which is connected to the unit.



1	Unit	**9**	Heat exchanger coil
2	Heat exchanger	**10**	Domestic hot water tank (optional)
3	Pump		
4	Shut-off valve	**FHL1..3**	Floor heating loop (field supply)
5	Collector (field supply)		
6	Motorised 3-way valve (optional)	**T1..3**	Individual room thermostat (field supply)
7	By-pass valve (field supply)	**M1..3**	Individual motorised valve to control loop FHL1 (field supply)
8	Booster heater		
		I	User interface

Pump operation

With no thermostat connected to the unit (1), the pump (3) can be configured to operate either as long as the unit is on, or until the required water temperature is reached.

NOTE Details on pump configuration can be found under "Pump operation configuration" on page 23.

Space heating

The unit (1) will operate to achieve the target leaving water temperature as set on the user interface.

When circulation in each space heating loop (FHL1..3) is controlled by remotely controlled valves (M1..3), it is important to provide a by-pass valve (7) to avoid the flow switch safety device from being activated.

The by-pass valve should be selected as such that at all time the minimum water flow as mentioned under "Water pipework" on page 13 is guaranteed.

Domestic water heating

When domestic water heating mode is enabled (either manually by the user, or automatically through a schedule timer) the target domestic hot water temperature will be achieved by a combination of the heat exchanger coil and the electrical booster heater.

When the domestic hot water temperature is below the user configured set point, the 3-way valve will be activated to heat the domestic water by means of the heat pump. In case of large domestic hot water demand or a high domestic hot water temperature setting, the booster heater (8) can provide auxiliary heating.

It is possible to connect either a 2-wire or a 3-wire 3-way valve (6). Make sure to fit the 3-way valve correctly. For more details, refer to "Wiring the 3-way valve" on page 20.

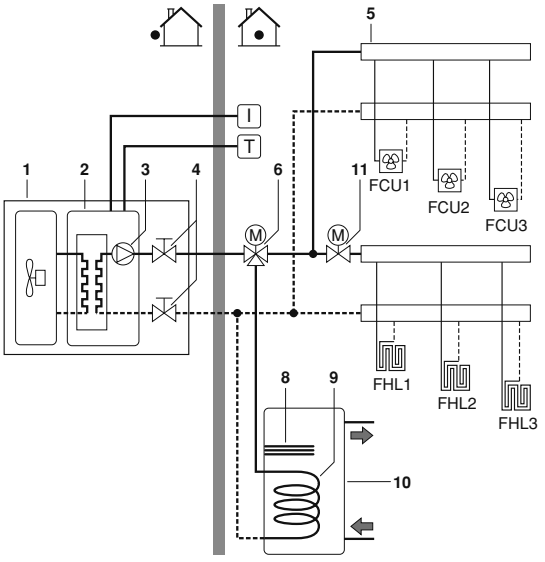
NOTE

The unit can be configured so that at low outdoor temperatures the domestic water is exclusively heated by the booster heater. This assures that the full capacity of the heat pump is available for space heating.

Details on domestic hot water tank configuration for low outdoor temperatures can be found under "Field settings" on page 25, field settings [5-02] to [5-04].

Application 3

*Space cooling and heating application with a **room thermostat suitable for heating/cooling changeover** connected to the unit. Heating is provided through floor heating loops and fan coil units. Cooling is provided through the fan coil units only.*
Domestic hot water is provided through the domestic hot water tank which is connected to the unit.



1	Unit	**10**	Domestic hot water tank
2	Heat exchanger	**11**	Motorised 2-way valve (field supply)
3	Pump		
4	Shut-off valve	**FCU1..3**	Fan coil unit (field supply)
5	Collector (field supply)	**FHL1..3**	Floor heating loop (field supply)
6	Motorised 3-way valve (optional)	**T**	Room thermostat with heating/cooling switch (optional)
8	Booster heater		
9	Heat exchanger coil	**I**	User interface

Pump operation and space heating and cooling

According to the season, the customer will select cooling or heating on the room thermostat (T). This selection is not possible by operating the user interface.

When space heating/cooling is requested by the room thermostat (T), the pump will start operating and the unit (1) will switch to "heating mode"/"cooling mode". The unit (1) will start operating to achieve the target leaving cold/hot water temperature.

In case of cooling mode, the motorised 2-way valve (11) will close as to prevent cold water running through the floor heating loops (FHL).

Make sure to connect the thermostat wires to the correct terminals (see "Connection of the thermostat cable" on page 20) and to configure the DIP switch toggle switches correctly (see "Room thermostat installation configuration" on page 23).

Wiring of the 2-way valve (11) is different for a NC (normal closed) valve and a NO (normal open) valve! Make sure to connect to the correct terminal numbers as detailed on the wiring diagram.

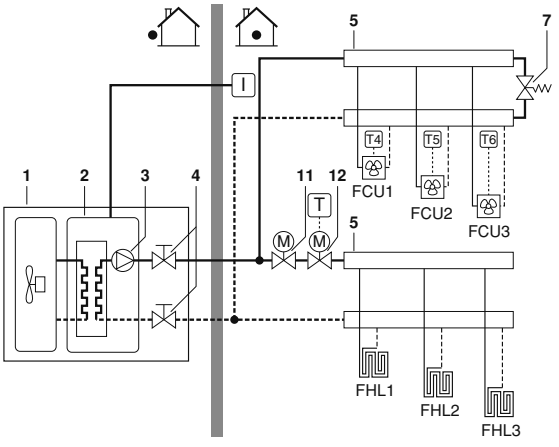
The ON/OFF setting of the heating/cooling operation is done by the room thermostat and cannot be done by the user interface.

Domestic water heating

Domestic water heating is as described under "Application 2" on page 7.

Application 4

*Space cooling and heating application **without a room thermostat connected to the unit**, but with a heating only room thermostat controlling the floor heating and a heating/cooling thermostat controlling the fan coil units. Heating is provided through floor heating loops and fan coil units. Cooling is provided through the fan coil units only.*



1	Unit	**12**	Motorised 2-way valve for activation of the room thermostat (field supply)
2	Heat exchanger		
3	Pump	**FCU1..3**	Fan coil unit with thermostat (field supply)
4	Shut-off valve		
5	Collector (field supply)	**FHL1..3**	Floor heating loop (field supply)
7	By-pass valve (field supply)	**T**	Heating only room thermostat (optional)
11	Motorised 2-way valve to shut off the floor heating loops during cooling operation (field supply)	**T4..6**	Individual room thermostat for fan coil heated/cooled room (optional)

With no thermostat connected to the unit (1), the pump (3) can be configured to operate either as long as the unit is on, or until the required water temperature is reached.

NOTE Details on pump configuration can be found under "Pump operation configuration" on page 23.

Space heating and cooling

According to the season, the customer will select cooling or heating through the user interface.

The unit (1) will operate in cooling mode or heating mode to achieve the target leaving water temperature.

With the unit in heating mode, the 2-way valve (11) is open. Hot water is provided to both the fan coil units and the floor heating loops.

With the unit in cooling mode, the motorised 2-way valve (11) is closed to prevent cold water running through the floor heating loops (FHL).

When closing several loops in the system by remotely controlled valves, it might be required to install a by-pass valve (7) to avoid the flow switch safety device from being activated. See also "Application 2" on page 7.

Wiring of the 2-way valve (11) is different for a NC (normal closed) valve and a NO (normal open) valve! Make sure to connect to the correct terminal numbers as detailed on the wiring diagram.

The ON/OFF setting of the heating/cooling operation is done by the user interface.

Application 5

Space heating with an auxiliary boiler (alternating operation)

Space heating application by either the Daikin unit or by an auxiliary boiler connected in the system. The decision whether either the E(D/B) unit or the boiler will operate can be achieved by an auxiliary contact or an E(D/B)* indoor controlled contact.*

The auxiliary contact can e.g. be an outdoor temperature thermostat, an electricity tariff contact, a manually operated contact, etc. See "Field wiring configuration A" on page 10.

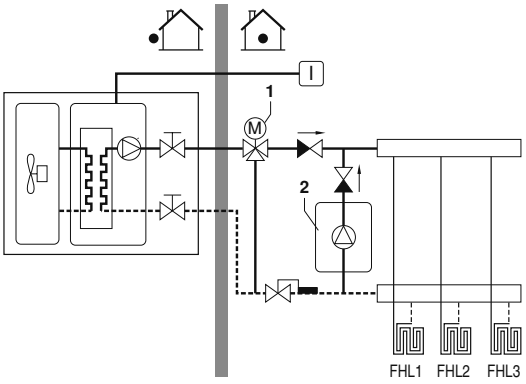
The E(D/B) unit controlled contact (also called 'permission signal for the auxiliary boiler") is determined by the outdoor temperature (thermistor located at the outdoor unit). See "Field wiring configuration B" on page 10.*

Bivalent operation is only possible for space heating operation, **not** for the domestic water heating operation. Domestic hot water in such an application is always provided by the domestic hot water tank which is connected to the Daikin unit.

The auxiliary boiler must be integrated in the piping work and in the field wiring according to the illustrations below.

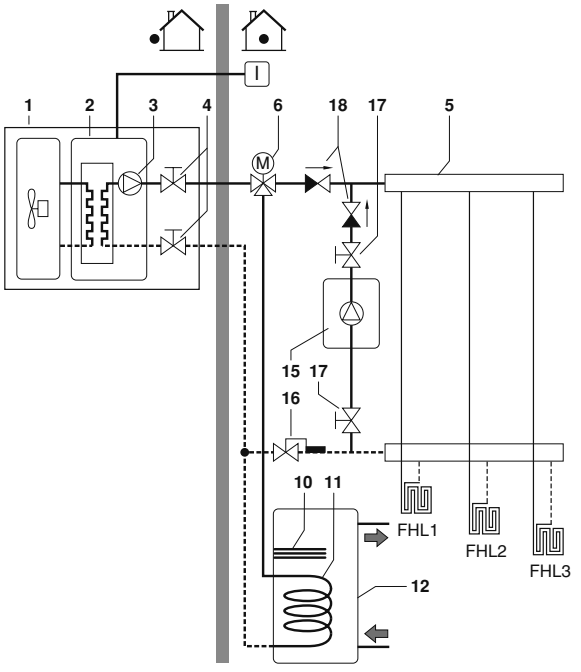
CAUTION

- Be sure that the boiler and the integration of the boiler in the system is in accordance with relevant local laws and regulations.
- Always install a 3-way valve, even if no domestic hot water tank is installed. This to ensure that the freeze protection function (see "[4-04] Freeze protection function" on page 28) can operate when the boiler is active.



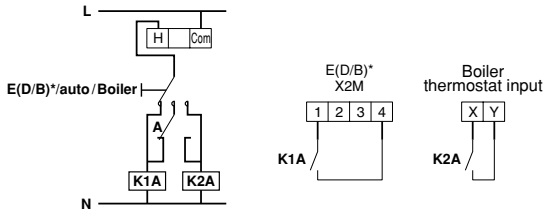
1	Motorised 3-way valve
2	Boiler

- Daikin can not be put responsible for incorrect or unsafe situations in the boiler system.



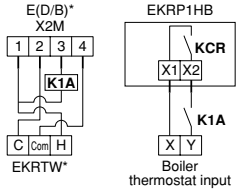
1	Outdoor unit	**12**	Domestic hot water tank (optional)
2	Heat exchanger		
3	Pump	**15**	Boiler (field supply)
4	Shut-off valve	**15**	Aquastat valve (field supply)
5	Collector (field supply)		
6	Motorised 3-way valve (delivered with the domestic hot water tank)	**16**	Shut-off valve (field supply)
		17	Non-return valve (field supply)
10	Booster heater		
11	Heat exchanger coil	**FHL1...3**	Floor heating loop (field supply)

Field wiring configuration A



Boiler thermostat input	Boiler thermostat input
A	Auxiliary contact (normal closed)
H	Heating demand room thermostat (optional)
K1A	Auxiliary relay for activation of E(D/B)* unit (field supply)
K2A	Auxiliary relay for activation of boiler (field supply)

Field wiring configuration B



Boiler thermostat input	Boiler thermostat input
C	Cooling demand room thermostat (optional)
H	Heating demand room thermostat (optional)
Com	Common room thermostat (optional)
K1A	Auxiliary relay for activation of bolier unit (field supply)
KCR	Permission signal for the auxiliary boiler

Operation

■ **Configuration A**

When the room thermostat requests heating, either the E(D/B)* unit or the boiler starts operating, depending on the position of the auxiliary contact (A).

■ **Configuration B**

When the room thermostat requests heating, either the E(D/B)* unit or the boiler starts operating, depending on the outdoor temperature (status of "permission signal for the auxiliary boiler").

When the permission is given towards the boiler, the space heating operation by the E(D/B)* unit will be automatically switched off.

For more details see field setting [C-02~C-04].

NOTE

■ **Configuration A**
Make sure that auxiliary contact (A) has sufficient differential or time delay so as to avoid frequent changeover between the E(D/B)* unit and the boiler. If the auxiliary contact (A) is an outdoor temperature thermostat, make sure to install the thermostat in the shade, so that it is not influenced or turned ON/OFF by the sun.

Configuration B
Make sure that the bivalent hysteresis [C-04] has sufficient differential to avoid frequent changeover between the E(D/B)* unit and the boiler. As the outdoor temperature is measured via the outdoor unit, air thermistor make sure to install the outdoor unit in the shade, so that it is not influenced by the sun.

Frequent switching may cause corrosion of the boiler in an early stage. Contact the manufacturer of the boiler.

■ During heating operation of the E(D/B)* unit, the unit will operate so as to achieve the target leaving water temperature as set on the user interface. When weather dependent operation is active, the water temperature is determined automatically depending on the outdoor temperature.

During heating operation of the boiler, the boiler will operate so as to achieve the target leaving water temperature as set on the boiler controller.

Never set the target leaving water temperature set point on the boiler controller above 131°F (55°C).

■ Make sure to only have 1 expansion vessel in the water circuit. An expansion vessel is already premounted in the Daikin unit.

NOTE

Make sure to configure the DIP switch SS2-3 on the PCB of the E(D/B)* switchbox correctly. Refer to "Room thermostat installation configuration" on page 23.

For configuration B: Make sure to configure the field settings [C-02, C-03 and C-04] correctly. Refer to "Bivalent operation" on page 33.

CAUTION

Make sure that return water to the E(D/B)* heat exchanger never exceeds 131°F (55°C).

For this reason, never put the target leaving water temperature set point on the boiler controller above 131°F (55°C) and install an aquastat[(a)] valve in the return water flow of the E(D/B)* unit.

Make sure that the non-return valves (field supply) are correctly installed in the system.

Make sure that the room thermostat (th) is not frequently turned ON/OFF.

Daikin shall not be held liable for any damage resulting from failure to observe this rule.

(a) The aquastat valve must be set for 131°F (55°C) and must operate to close the return water flow to the unit when the measured temperature exceeds 131°F (55°C). When the temperature drops to a lower level, the aquastat valve must operate to open the return water flow to the E(D/B)* unit again.

Manual permission towards the E(D/B)* unit on the boiler.

In case only the E(D/B)* unit should operate in space heating mode, disable the bivalent operation via setting [C-02].

In case only the boiler should operate in space heating mode, increase the bivalent ON temperature [C-03] to 77°F (25°C).

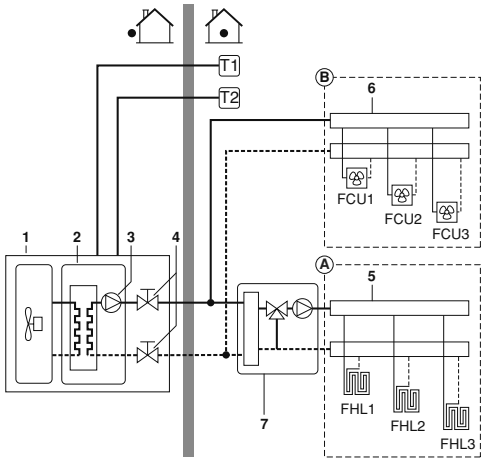
Application 6

Space heating with room thermostat application through floor heating loops and fan coil units. The floor heating loops and fan coil units require different operating water temperatures.

The floor heating loops require a lower water temperature in heating mode compared to fan coil units. To achive these two set points, a mixing station is used to adapt the water temperature according to requirements of the floor heating loops. The fan coil units are directly connected to the unit water circuit and the floor heating loops after the mixing station. The control of this mixing station is not done by the unit.

The operation and configuration of the field water circuit is the responsibility of the installer.

Daikin only offers a dual set point control function. By this function two set points can be generated. Depending on the required water temperature (floor heating loops and/or fan coil units are required) first set point or second set point can be activated.



1	Outdoor unit	**7**	Mixing station (field supply)
2	Heat exchanger	**T1**	Room thermostat for zone A (optional)
3	Pump		
4	Shut-off valve	**T2**	Room thermostat for zone B (optional)
5	Collector zone A (field supply)	**FCU1..3**	Fan coil unit (optional)
6	Collector zone B (field supply)	**FHL1...3**	Floor heating loop (field supply)

The advantage of the dual set point control is that the heat pump will/can operate at the lowest required leaving water temperature when only floor heating is required. Higher leaving water temperatures are only required in case fan coil units are operating.
This results in a better performance of the heat pump.

Pump operation and space heating

When the room thermostat for the floor heating loop (T1) and the fan coil units (T2) are connected to the indoor unit, the pump (4) will operate when there is a request for heating from T1 and/or T2. The outdoor unit will start operating to achieve the target leaving water temperature. The target leaving water temperature depends on which room thermostat is requesting heating.

	Set point	Field setting	Thermo status			
Zone A	First	UI	ON	OFF	ON	OFF
Zone B	Second	[7-03]	OFF	ON	ON	OFF
Resulting water temperature			UI	[7-03]	[7-03]	—
Result pump operation			ON	ON	ON	OFF

When the room temperature of both zones is above the thermostat set point, the outdoor unit and pump will stop operating.

NOTE

- Make sure to connect the thermostat wires to the correct terminals (see "Overview of the unit" on page 11).
- Make sure to configure the field settings [7-02], [7-03] and [7-04] correctly. Refer to "Dual set point control" on page 30.
- Make sure to configure the DIP switch SS2-3 on the PCB of the E(D/B) switch box correctly. Refer to "Room thermostat installation configuration" on page 23.

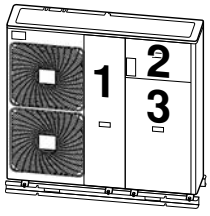
NOTE

- The request signals for space heating can be implemented in two different ways (installer choice).
  - Thermo ON/OFF signal from room thermostat
  - Status signal (active/not active) from the mixing station
- It is the installers responsibility to make sure no unwanted situations can occur (e.g. too high water temperatures towards floor heating loops, etc.)
- Daikin does not offer any type of mixing station. Dual set point control only provides the possibility to use two set points.
- When only zone A request heating, zone B will be fed with water at a temperature equal to the first set point.
  This can lead to unwanted heating of zone B.
- When only zone B request heating, the mixing station will be fed with water at a temperature equal to the second set point.
  Depending on the control of the mixing station, the floor heating loop can still receive water at a temperature equal to set point of the mixing station.

Be aware that the actual water temperature through the floor heating loops depends on the control and setting of the mixing station.

Overview of the unit

Opening the unit



Door 1	gives access to the compressor compartment and electrical parts
Door 2	gives access to the electrical parts of the hydraulic compartment
Door 3	gives access to the hydraulic compartment

Switch off all power supply — i.e. unit power supply and backup heater and domestic hot water tank power supply (if applicable) — before removing doors 1 and 2.

Parts inside the unit can be hot.

12. Installation - Monobloc

12.1 Installation Location

- The equipment is not is not intended for use in a potentially explosive atmosphere.
- Choose a place solid enough to bear the weight and vibration of the unit, where operation sounds will not be amplified.
- Choose a location where the hot/cold air discharged from the unit and the operation sounds will not be bothersome to neighbors or users.
- Avoid places such as bedrooms so that operation sounds are not a problem.
- Allow sufficient space for carrying the unit into and out of the site.
- Ensure there is sufficient space for air passage and a lack of obstructions around the air inlet and the air outlet.
- The site must be free from the possibility of flammable gas leakage in any nearby area.
- Install units, power cable, and inter-unit cables at least 10 feet (3 m) away from televisions and radios to prevent interference.
- Depending on radio wave conditions, electromagnetic interference may still occur even if installed more than 10 ft. (3 m) away.
- In coastal areas or other places with salty atmosphere of sulfate gas, corrosion my shorten the life of the outdoor unit.
- Since condensate flows out of the outdoor unit, do not place anything under the unit that must be kept from moisture.

IN COLD CLIMATES:

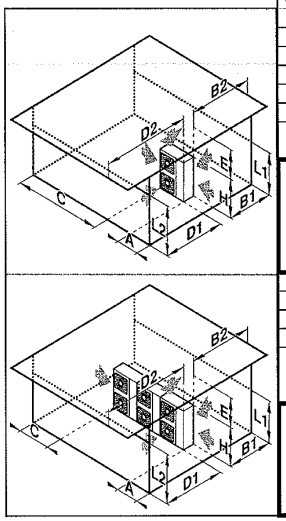
- To prevent exposure to wind, install the outdoor unit with its suction side facing the wall.
- Never install the outdoor unit at a site where the suction side may be exposed directly to wind.
- To prevent exposure to wind, install a baffle plate on the air discharge side of the outdoor unit.
- Unit should be installed with a minimum of 4” (10 cm) free space below the unit’s bottom plate at all condition, e.g., heavy snowfall (construct a pedestal if necessary).
- In heavy snowfall areas, it is very important to select an installation site where the snow will not affect the unit. If lateral snowfall is possible, make sure the heat exchanger coil is not affected by the snow (construct a lateral canopy if necessary). See Figure 1:

1 Construct a large canopy.

2 Construct a pedestal. Install the unit high enough off the ground to prevent burying in snow.

12.2 Installation Space

A. NON STACKED INSTALLATION



↙	↗	↘	↖	↓			A	B1	B2	C	D1	D2	E	L1/L2	
✓								≥4 [100]							
✓		✓	✓				≥4[100]	≥4 [100]		≥4 [100]					
✓				✓				≥4 [100]				≤20 [500]	≥40 [1000]		
✓		✓	✓	✓			≥6[150]	≥6 [150]		≥6 [150]		≤20 [500]	≥40 [1000]		
	✓										≥20 [500]				
	✓			✓					≤20[500]		≥20 [500]		≥40 [1000]		
✓	✓				L1<L2			≥4 [100]			≥20 [500]				
					L2<L1			≥4 [100]			≥20 [500]				
					L1<L2	L1≤H		≥10 [250]	≤20 [500]		≥30 [750]		≥40 [1000]	0<L1≤1/2H	
											≥40 [1000]			0<L1≤1/2H	
						H<L1					L1≤H				
✓	✓			✓	L2<L1	L2≤H		≥4 [100]			≥40 [1000]	≥20 [500]	≥40 [1000]	0<L2≤1/2H	1
								≥8 [200]						1/2H<L2≤H	
						H<L2					L2≤H				
✓		✓	✓				≥8 [200]	≥12 [300]		≥40 [1000]					
✓		✓	✓	✓			≥8 [200]	≥12 [300]		≥40 [1000]		≤20[500]	≥40 [1000]		
	✓										≥40 [1000]				
	✓			✓					≤20[500]		≥40 [1000]		≥40 [1000]		
					L1<L2			≥12 [300]			≥40 [1000]				
✓	✓				L2<L1			≥10 [250]			≥60 [1500]			0<L2≤1/2H	
								≥12 [300]						1/2H<L2≤H	
					L1<L2	L1≤H		≥12 [300]	≤20 [500]		≥40 [1000]		≥40 [1000]	0<L1≤1/2H	
											≥50 [1250]			1/2H<L1≤H	1
						H<L1					L1≤H				
✓	✓			✓				≥10 [250]						0<L2≤1/2H	
					L2<L1	L2≤H		≥12 [300]			≥60 [1500]	≤20 [500]	≥40 [1000]	1/2H<L2≤H	2
						H<L2					L2≤H				

LEGEND (Unit: Inch [mm])

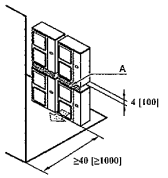
- ↙ Suction side obstacle
- ↗ Discharge side obstacle
- ↘ Left side obstacle
- ↖ Right side obstacle
- ↓ Top side obstacle
- ✓ Obstacle is present
- This situation is not allowed

1 In these cases, close bottom of the installation frame to prevent discharged air from being bypassed

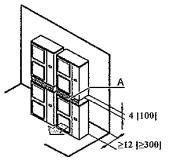
2 In these cases, only 2 units can be installed

B. STACKED INSTALLATION

1. OBSTACLES EXIST IN FRONT OF THE OUTLET SIDE



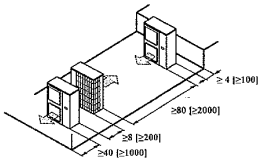
2. OBSTACLES EXIST IN FRONT OF THE AIR INLET



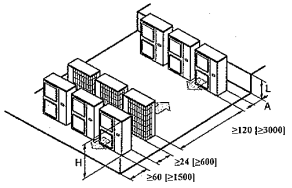
Do not stack more than one unit.
About 4 in. (100mm) is required as the dimension for laying the upper outdoor unit's drain pipe.
Get the portion A sealed so that air from the outlet does not bypass.

C. MULTIPLE-ROW INSTALLATION

1. INSTALLATION OF ONE UNIT PER ROW



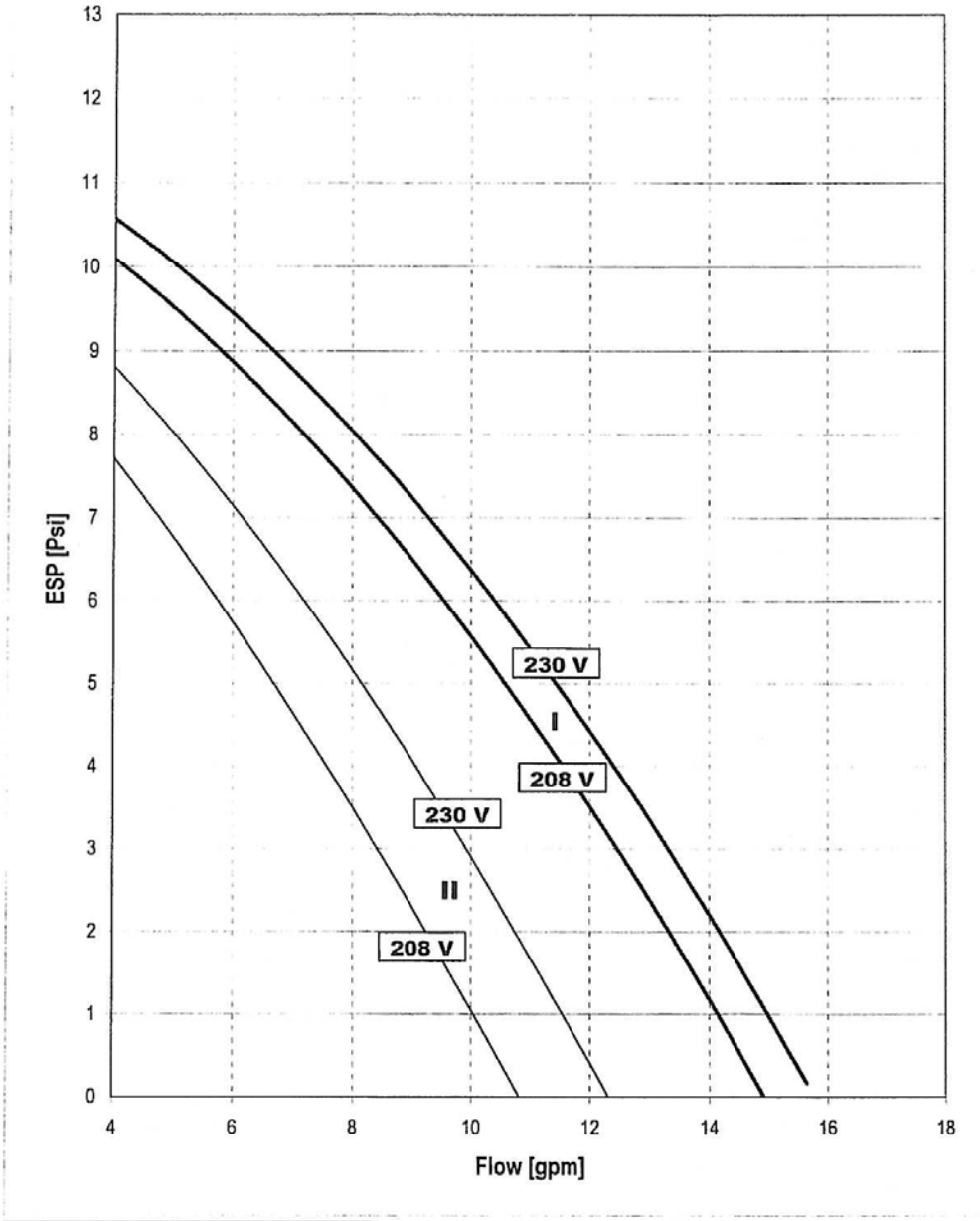
2. INSTALLING MULTIPLE UNITS (2 units or more) IN LATERAL CONNECTION PER ROW



Relation of dimensions of H, A and L are shown in the table below.

	L	A
L ≤ H	0<L≤1/2H	10 [250]
	1/2H < L	12 [300]
H < L	Installation not allowed	

13. Hydronic Performance - Monobloc

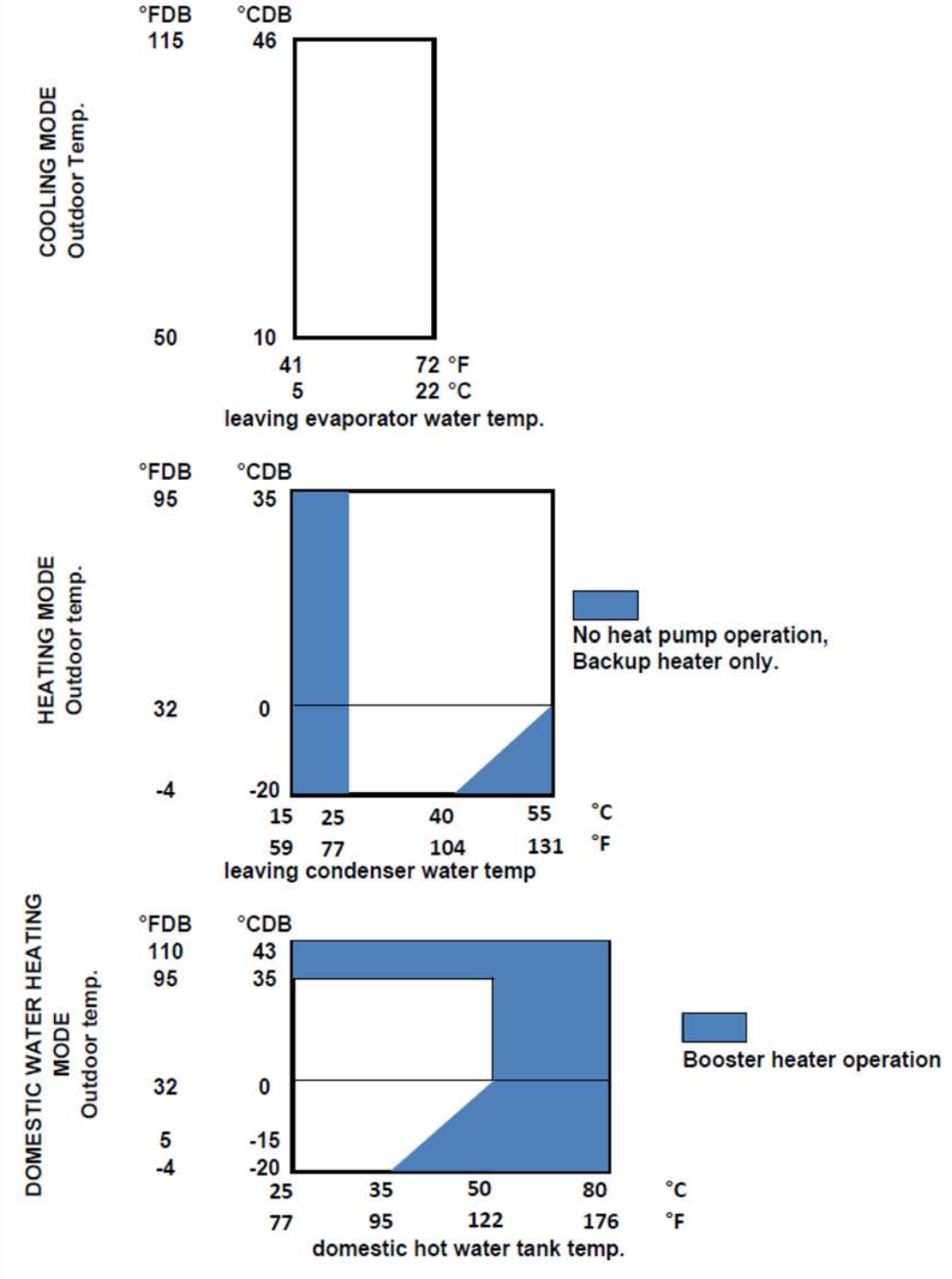


I high speed
II medium speed
ESP : external static pressure
Flow : waterflow through the unit

IMPERIAL UNITS OF MEASURE

Caution :
Selecting a flow outside the curves can cause damage to or malfunction of the unit. See also minimum and maximum allowed water flowrange in the technical specifications.

14. Operation Range - Monobloc



1. Domestic Hot Water Tank

1.1 Features

- Stainless steel domestic hot water tank & heat exchanger
- Integrated 3kW electric booster heater
- Two sizes (50 gal & 80 gal)
- 3-way valve included

Domestic Hot Water (DHW) Tank

The EKHWS domestic hot water tank with integrated 3 kW electric booster heater can be connected to both the split system hydrobox or monobloc. The domestic hot water tank is available in two sizes: 50 gallon (200 liter) or 80 gallon (300 liter). These domestic hot water tanks are for floor-standing indoor installations.

2. Specifications - DHW

2-1 TECHNICAL SPECIFICATIONS				EKHWS050BA3VJU	EKHWS080BA3VJU
Casing	Color			Neutral white	
	Material			Epoxy-coated mild steel	
Dimensions	Packing	Height	in (mm)	47-1/4 (1,200)	65 (1,650)
		Width	in (mm)	23-5/8 (600)	23-5/8 (600)
		Depth	in (mm)	23-5/8 (600)	23-5/8 (600)
	Unit	Height	in (mm)	45-3/8 (1,150)	63 (1,600)
		Width	in (mm)	22-7/8 (580)	22-7/8 (580)
		Depth	in (mm)	22-7/8 (580)	22-7/8 (580)
Weight	Unit		lb (kg)	99.2 (45)	130 (59)
	Packed Unit		lb (kg)	112.4 (51)	145.5 (66)
Packing	Material			EPS	
				Carton	
	Weight		lb (kg)	8.81 (4)	11 (5)
Main components	Tank	Water volume	gal (l)	50 (200)	80 (300)
		Material		Stainless steel 316LSS	
		Max. temperature	°F (°C)	185 (85)	185 (85)
		Max. water pressure	PSI (bar)	145 (10)	145 (10)
Tank	Insulation	Material		Polyurethane foam	
		Min. thickness	in (mm)	1-5/8 (40)	1-5/8 (40)
Main components	Heat exchanger	Quantity		1	1
		Material		Stainless steel 316LSS	
	Booster heater	Quantity		1	1
		Capacity	BTU/hr (kW)	10,255 (3)	10,255 (3)
	3-Way Valve	Coefficient of flow at 14.5 PSI (1 bar)	gpm (m^3/h)	44 (10)	44 (10)
		Inlet	inch	Rp1	
		Outlet	inch	2xRp1	
Temperature sensor	Cable length		ft (m)	39.4 (12)	39.4 (12)
Piping connections	Water inlet H/E Diameter		inch (BSPP)	G 3/4 (female)	
	Water outlet H/E Diameter		inch (BSPP)	G 3/4 (female)	
	Cold water in Diameter		inch (BSPP)	G 3/4 (female)	
	Hot water out Diameter		inch (BSPP)	G 3/4 (female)	
	Recirculation connection		inch (BSPP)	G 3/4 (female)	

2-2 ELECTRICAL SPECIFICATIONS				EKHWS050BA3VJU	EKHWS080BA3VJU
Unit	Power Supply	Phase		1~	1~
		Frequency	Hz	60	60
		Voltage	V	208/230	208/230
	Current	Minimum Circuit Amps (MCA)	A	14.3	14.3
		Maximum Overcurrent Protection (MOP)	A	20	20

3. Domestic Hot Water Basic Performance Overview

The Daikin Altherma heat pump in combination with the optional domestic hot water tank provides hot water for household usage (Altherma TW DHW).

The following data provides information to select the proper sized domestic hot water tank to ensure maximum comfort and efficiency.

(1) Domestic hot water volume:

The volume of hot water available for domestic usage depends on the physical volume of the tank, the domestic hot water setpoint temperature, and the temperature spreading in the tank. Therefore the *equivalent hot water volume* is termed **EHWV**.

Definition EHWV = The volume of hot water available for domestic usage at a temperature of 104° (40°C), which is considered a comfortable domestic hot water temperature.

Tank	Setpoint temp °F (°C)	EHWV gal (l)	Usage Pattern		
			Modest	Medium	High
50 gal (200 l)	131 (55)	42 (160)			
	149 (65)	53 (200)	+	–	–
	167 (75)	63 (240)	++	+	–
80 gal (300 l)	131 (55)	78 (205)	++	++	–
	149 (65)	102 (385)	++	++	–
	167 (75)	102 (435)	++	++	+

Grade: ++ excessive availability of domestic hot water
+ sufficient availability of domestic hot water
– temporary shortage of domestic hot water can occur

Usage Pattern: Modest: Daily demand up to 58 gal (220 l) = typical 2-person usage pattern
Medium: Daily demand up to 85 gal (325 l) = typcial 3 - 4 person usage pattern
High: Daily demand up to 145 gal (550 l) = typical 4 - 6 person usage pattern

(2) Heat up time:

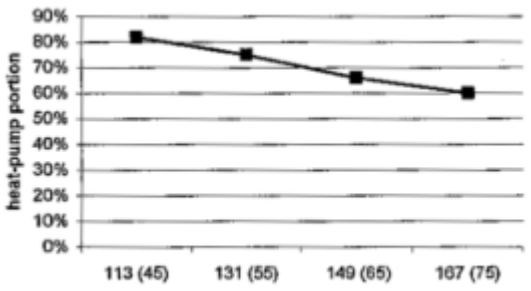
Definition of ***Heat-Up Time***: The time required to reheat the domestic hot water tank to 131 F (55 C) after tapping a certain volume of hot water. NOTE: Changing the field settings (see installation manual) can influence the heat-up time.

Tank	Setpoint °F (°C)	Heat up time for 39 gal (150 l) bath (min)	Heat up time for 13 gal (50 l) bath (min)
50 gal (200 l)	131 (55)	60	40
80 gal (300 l)	131 (55)	50	30

Conditions for testing: Ta =44.6°CDB / 42.8°FWB, Troom =68°F, Tstart = 50°F, outdoor unit type: ERLQ054*VJU
Conditions for testing: Ta = 7°CDB / 6 °CWB, Troom = 20°C, Tstart = 10°C, outdoor unit type: ERLQ054*VJU

(3) Efficiency of domestic hot water production:

In the Daikin Altherma system, both the heat pump and the electric booster heater supply the energy to produce domestic hot water. The higher the portion of energy supplied by the heat pump, the more energy efficient the system is. Lowering the setpoint temperature increases the portion of energy supplied by the heat pump and thus the efficiency of the system. The percentage of energy supplied by the heat pump in relation to total energy need for domestic hot water is displayed in the following graph:



Conditions:

Simulation of daily real-life conditions based upon medium usage.

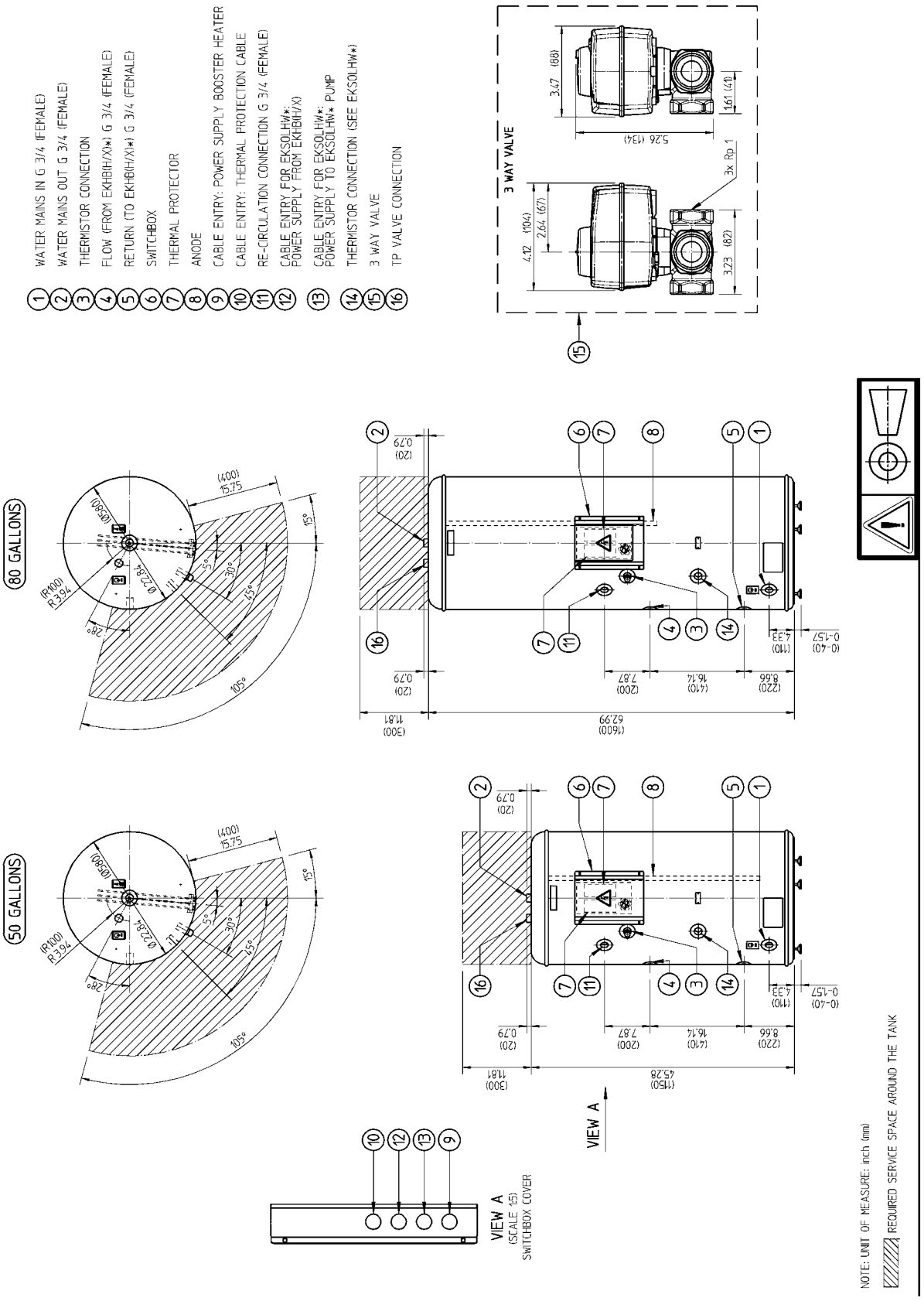
Outdoor temp: 44.6°FDB /42.8° FWB (7°CDB/ 6°CWB)

Room temp: 68 F (20 C)

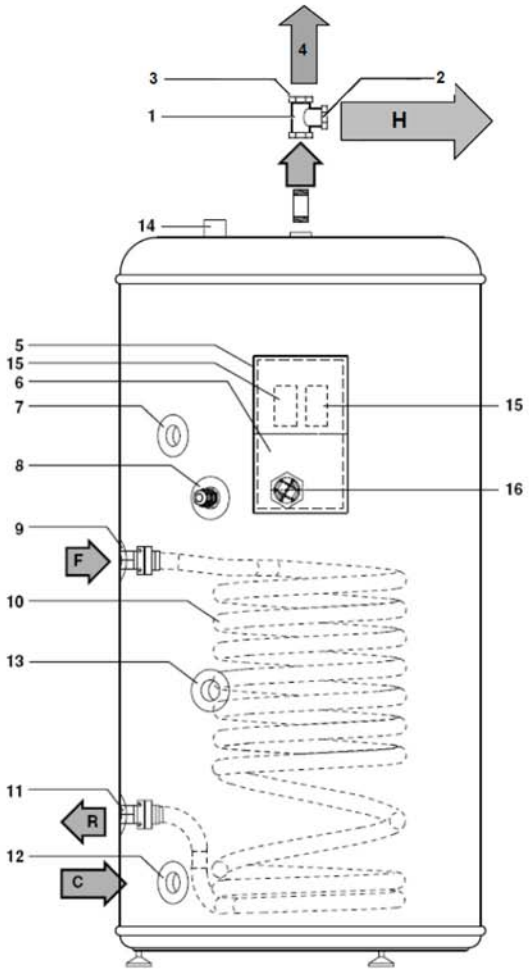
Tank Type: 50 gal (200 l)

Field Settings: Default field settings (see Installation Manual)

4. Dimensional Drawing & Center of Gravity - DHW


1 WATER MAINS IN G 3/4 (FEMALE)
2 WATER MAINS OUT G 3/4 (FEMALE)
3 THERMISTOR CONNECTION
4 FLOW (FROM EKHBH/X)★) G 3/4 (FEMALE)
5 RETURN (TO EKHBH/X)★) G 3/4 (FEMALE)
6 SWITCHBOX
7 THERMAL PROTECTOR
8 ANODE
9 CABLE ENTRY: POWER SUPPLY BOOSTER HEATER
10 CABLE ENTRY: THERMAL PROTECTION CABLE
11 RE-CIRCULATION CONNECTION G 3/4 (FEMALE)
12 CABLE ENTRY FOR EKSOLHW★: POWER SUPPLY FROM EKHBH/X)
13 CABLE ENTRY FOR EKSOLHW★: POWER SUPPLY TO EKSOLHW★ PUMP
14 THERMISTOR CONNECTION (SEE EKSOLHW★)
15 3 WAY VALVE
16 TP VALVE CONNECTION
3 WAY VALVE
3x Rp 1
80 GALLONS
50 GALLONS
VIEW A
VIEW A (SCALE 1:5) SWITCHBOX COVER
NOTE: UNIT OF MEASURE: inch (mm)
REQUIRED SERVICE SPACE AROUND THE TANK

4.1 Domestic Hot Water Tank Summary

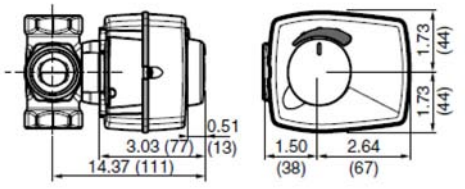


1	Field supply
2	Hot water connection (H)
3	Pressure relief valve connection
4	Pressure relief valve (field supply)
5	Electrical box
6	Electrical box lid
7	Recirculation hole
8	Thermistor socket
9	Flow inlet connection (F) (from the main unit)
10	Heat exchanger coil
11	Return outlet connection (R) (to the main unit)
12	Cold water connection (C)
13	Threaded thermistor hole for use with the solar kit option. Refer to the installation manual EKSOLHW*.
14	Temperature and pressure relief valve connection
15	Thermal protectors (Q2L, Q3L)
16	Booster heater
⇨	Flow direction

5. Three-Way Valve Summary

Connecting the 3-way valve

1 Refer to the figure below before making the connection. Values between brackets are the conversion from inch to mm.



2 Installation position.

It is advised to connect the 3-way valve as close as possible to the unit. It can be installed in accordance with one of the following four configurations.

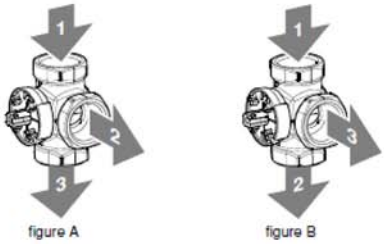


figure A

figure B

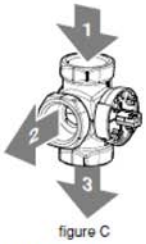


figure C

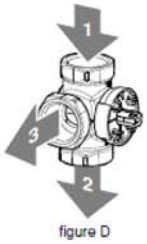
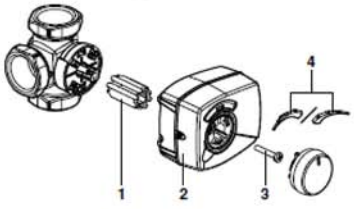


figure D

1 From indoor unit
2 To domestic hot water tank
3 To room heating

3 Unpack the 3-way valve body and 3-way valve motor.

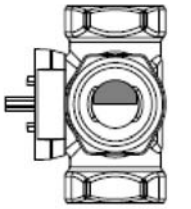
Verify that following accessories are provided with the motor.



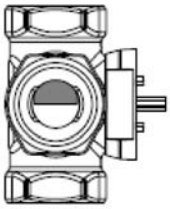
1 Sleeve
2 Valve motor cover
3 Screw
4 Scale

4 Install the 3-way valve body in the pipework.

- Make sure the shaft will be positioned in such a way that the motor can be mounted and replaced.
- Put the sleeve on the valve and turn the valve to the middle position of the scale plate.
  Check that the valve is positioned as in the figure below. It shall be blocking the outlet connection to the domestic hot water for 50% and the outlet connection to the room heating also for 50%.



Installation in accordance with figure A and figure B



Installation in accordance with figure C and figure D

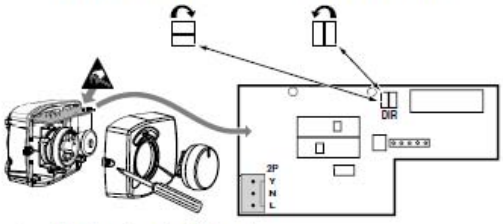
NOTE If the valve is not positioned in this way before mounting the motor, the valve will give way to both domestic water and room heating during operation.

5 When installing in accordance with figure A or figure D, open the valve motor cover by loosening the screw and change the jumper so as to change the rotation direction of the valve.

By default the jumper is factory set to apply for installation in accordance with figure B and figure C.

Installation in accordance with figure A and figure D

Installation in accordance with figure B and figure C



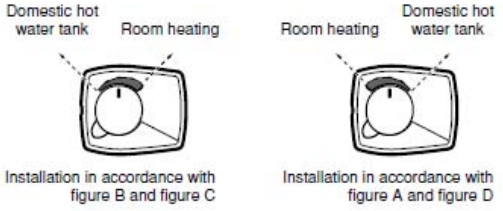
Rotation direction of the valve

6 Push the motor on the motor sleeve.

Make sure not to rotate the sleeve during this action, so as to maintain the valve position as set during step 4.

7

8 Put the scale on the valve as shown below.

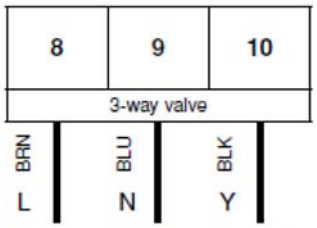


Installation in accordance with figure B and figure C

Installation in accordance with figure A and figure D

9 Make sure to firmly fix the power supply cord onto the 3-way valve body with a field supplied cable tie like in illustration below.

10 Perform the wiring in the unit in accordance with the following figure:



Refer also to the drawing on page 8.

11 Connect the water inlet and water outlet.

12 Connect the hot and cold water supply tubes.

13 Connect the pressure relief valve (field supply, opening pressure maximum 145 psi (10 bar)) and drain.

CAUTION

If a discharge pipe is connected to the pressure relief device it must be installed in a continuously downward direction and in a frost-free environment. It must be left open to the atmosphere.

Options

1. Solar Kit (EKSOLHWBAVJU) - Features

- Connectable to solar collectors
- Easy connection to EKHWS* DHW tanks
- Enables DHW heating by means of the sun

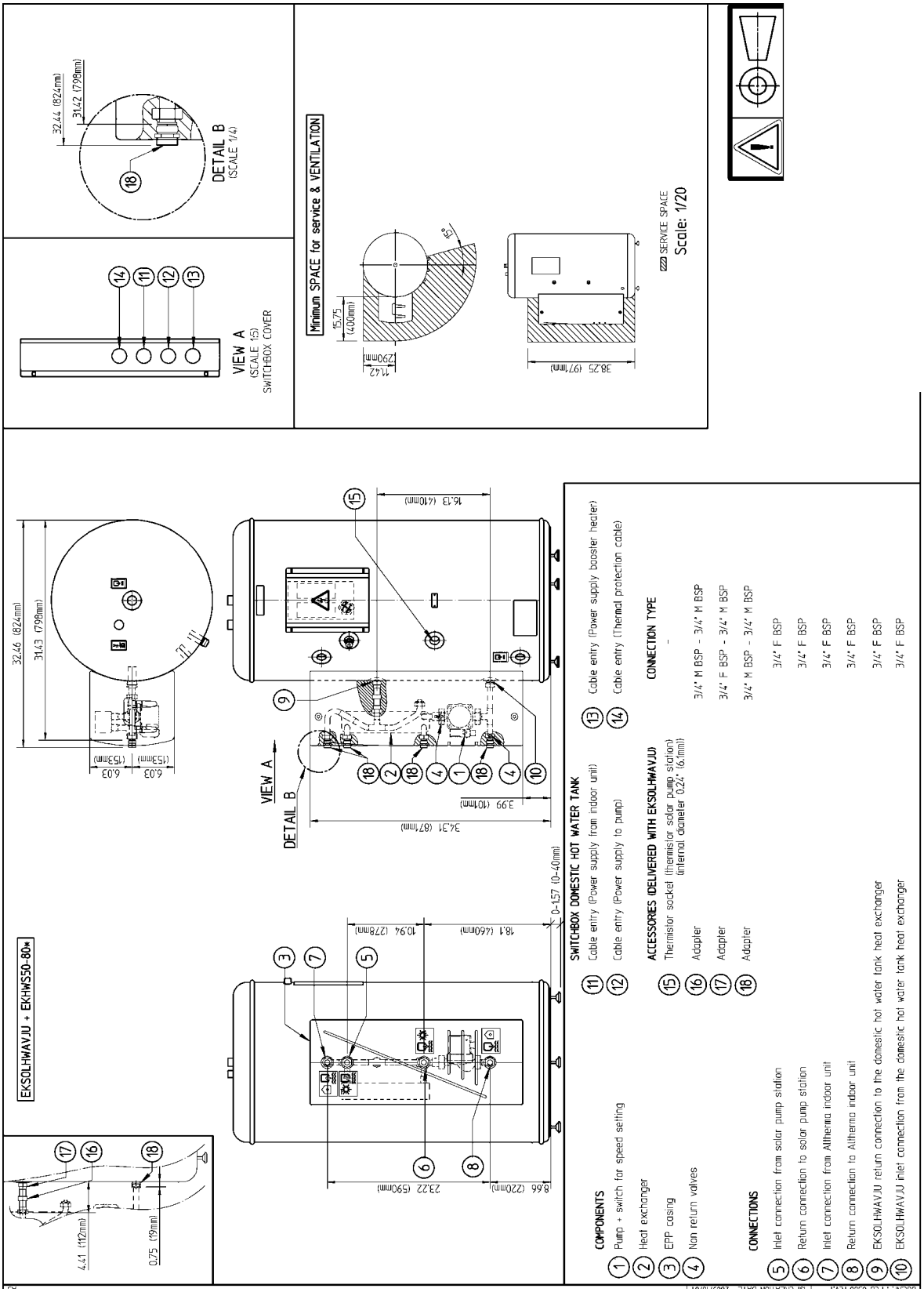
The solar kit is to be connected to the Daikin domestic hot water tank. The solar kit will enables domestic hot water to be heated by the sun when it is available. The solar kit intergrates the field-supplied solar thermal panels with the pump station and the Daikin domestic hot water tank.

1.1 Specifications – Solar Kit

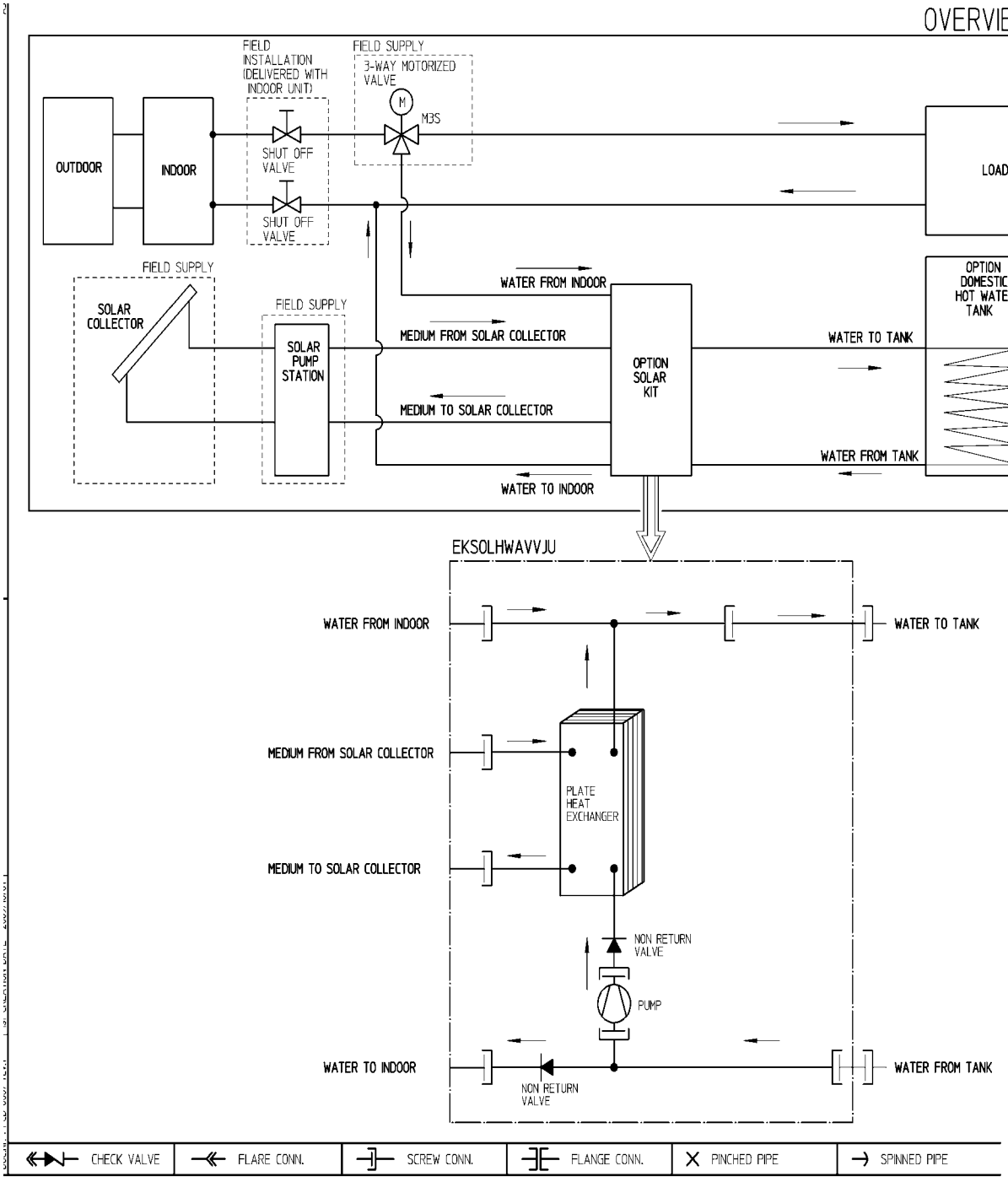
2-1 TECHNICAL SPECIFICATIONS				EKSOLHWBAVJU
Dimensions	Packing	Height	in (mm)	31-3/8 (795)
		Width	in (mm)	13-1/2 (340)
		Depth	in (mm)	11-5/8 (295)
	Unit	Height	in (mm)	30-3/8 (770)
		Width	in (mm)	12-1/8 (305)
		Depth	in (mm)	10-3/4 (270)
Weight	Unit		lb (kg)	17.6 (8)
	Packed Unit		lb (kg)	19.8 (9)
Packing	Material			Carton
	Weight		lb (kg)	1
Heat Exchanger	Type			Brazed plate
	Pressure drop	Solar side	PSI (kPa)	3.12 (21.5)
	Maximum inlet temperature	Solar side	°F (°C)	230°F (110°C)
	Capacity		W/K	1,400
	Logarithmic mean temperature difference (LMTD)		K	5
Pump	Type			water cooled
	Number of speeds			3
	Power input		W	46
Sound	Sound Pressure		dBA	27
Water circuit	Piping connections diameter		inch FBSP	3/4
Insulation material				EPP
Ambient temperature	Maximum		°F (°C)	95 (35)
	Minimum		°F (°C)	1

2-2 ELECTRICAL SPECIFICATIONS				EKSOLHWBAVJU
Unit	Power Supply	Phase		1~
		Frequency	Hz	60
		Voltage	V	208/230
Voltage range	Minimum			-10%
	Maximum			+10%
Power Supply Intake				indoor unit

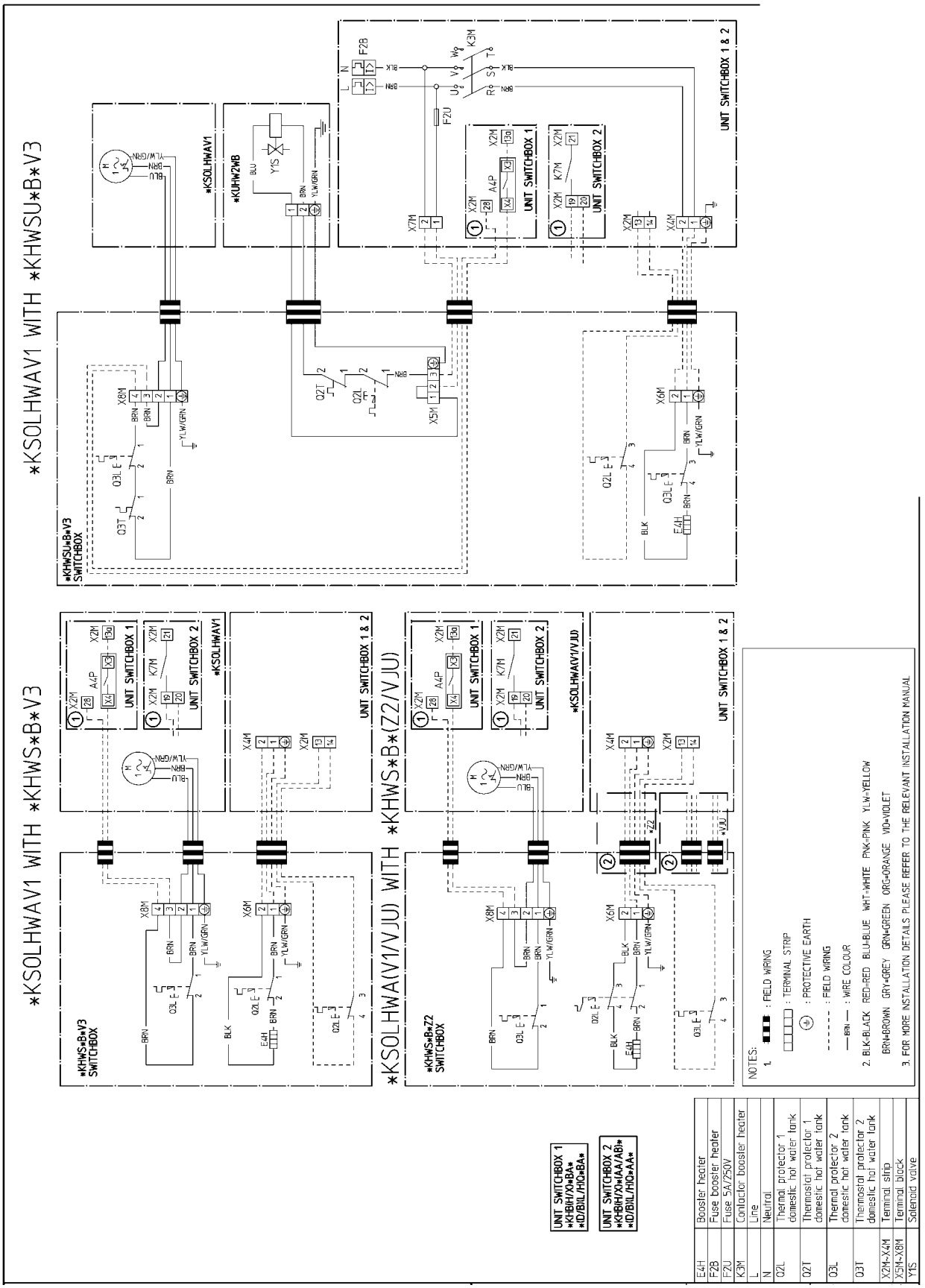
1.2 Dimensional Drwg. & Center of Gravity - Solar Kit



1.3 Piping Diagram - Solar Kit



1.4 Wiring Diagram - Solar Kit



2. Room Thermostat – EKRTWA

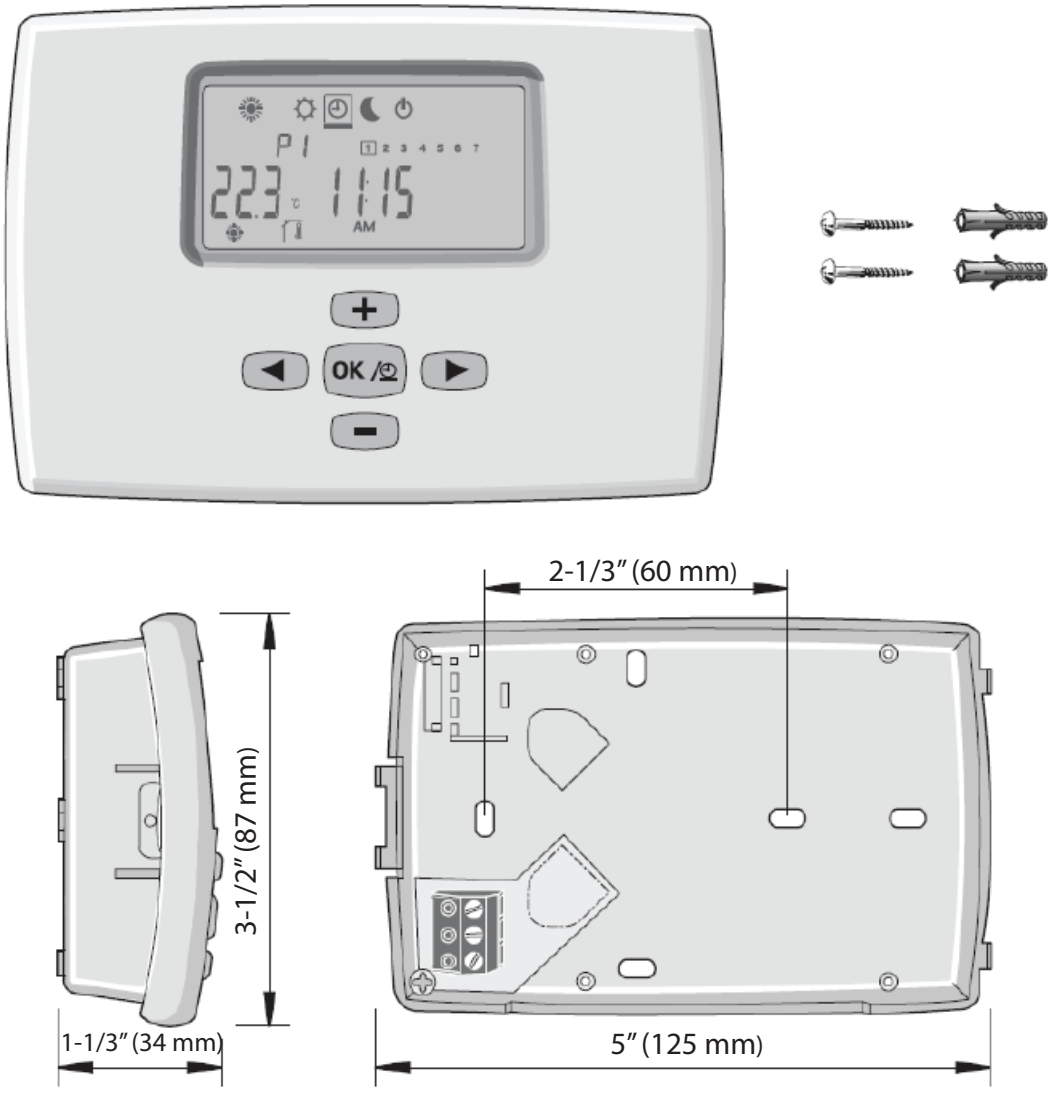
Functions	Wired room thermostat EKRTWA
Heating only	✓
Heating and cooling	✓
Comfort function mode	✓
Reduced function mode	✓
Scheduled function mode	✓
Number of setpoint changes	12/day
Holiday function mode	✓
Off function	✓
Setpoint limitation	✓
Keylock function	✓

2.1 Specifications - Room Thermostat

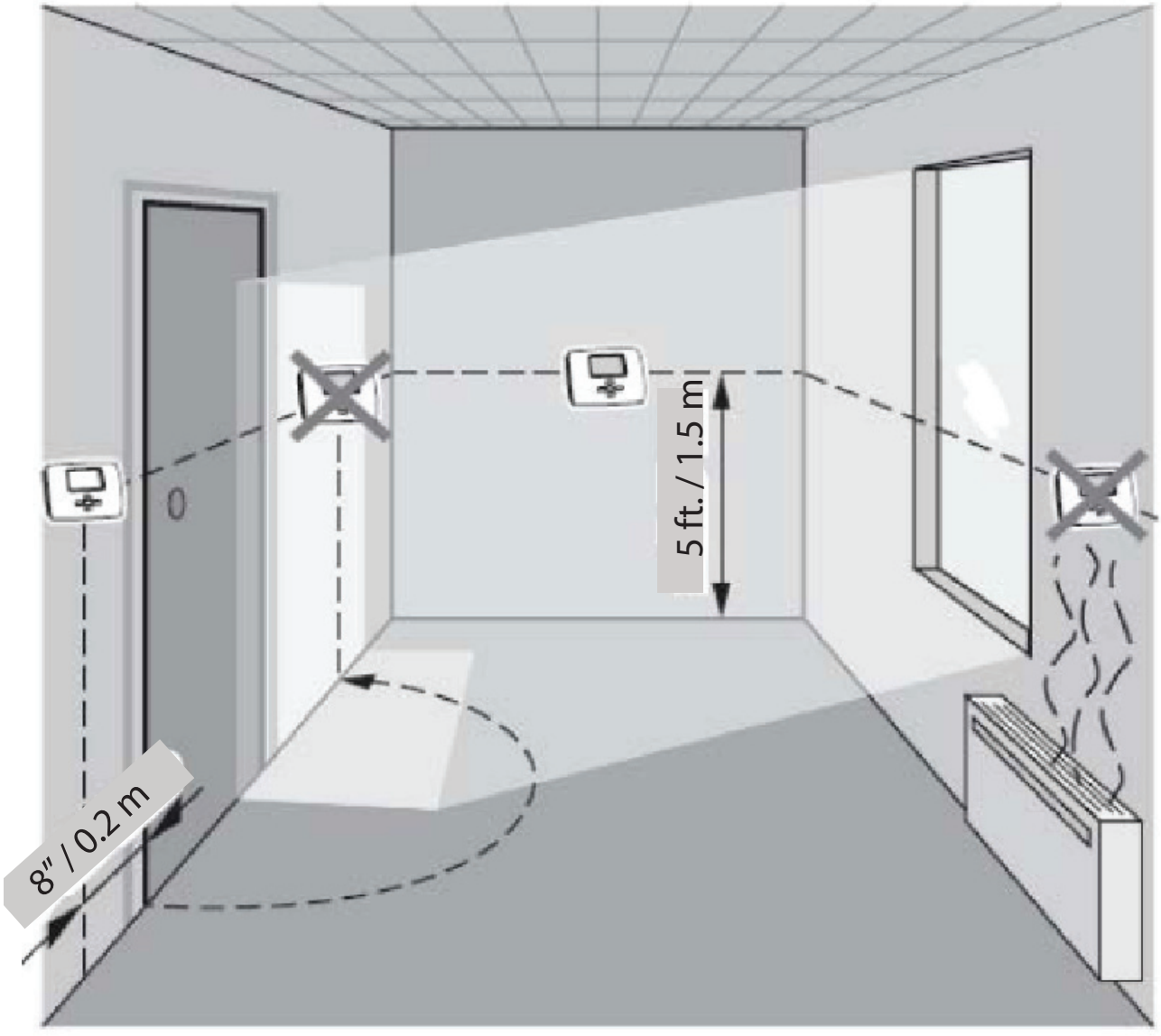
4-1 TECHNICAL SPECIFICATIONS				EKRTW
Dimensions	Unit	Height	in (mm)	3-1/2 (87)
		Width	in (mm)	5 (125)
		Depth	in (mm)	1-3/8 (34)
	Packing	Height	in (mm)	2-5/8 (65)
		Width	in (mm)	7 (175)
		Depth	in (mm)	4 (100)
Weight	Unit	Net	oz (g)	7.6 (215)
		Gross	oz (g)	15.5 oz (440 g)
Packing	Material			Carton
	Weight		oz (g)	2 (55)
Ambient temperature	Storage		°F (°C)	-4~140 (-20~60)
	Operation		°F (°C)	32~122 (0~50)
Temperature setting range	Heating		°F (°C)	39.2–98.6 (4–37)
	Cooling		°F (°C)	39.2–98.6 (4–37)
Temperature setting resolution			°F (°C)	32.9 (0.5)
Clock				Yes
Regulation function				Proportional band
Features	Item			Heating only
				Heating and cooling
				Comfort function mode (= comfort setpoint)
				Reduced function mode (=night setback setpoint)
				Scheduled function mode(= schedule timer)
				Number of setpoint changes
	Note			12/day
	Item			Holiday function mode
				Off function (with integrated frost protection)
				Setpoint limitation
				Keylock function

4-2 ELECTRICAL SPECIFICATIONS			EKRTW
Power Supply	Voltage		battery powered 3* AA-LR6 (alkaline)
Connection			Wired
Output relays			Maximum load 1A - 24 VAC

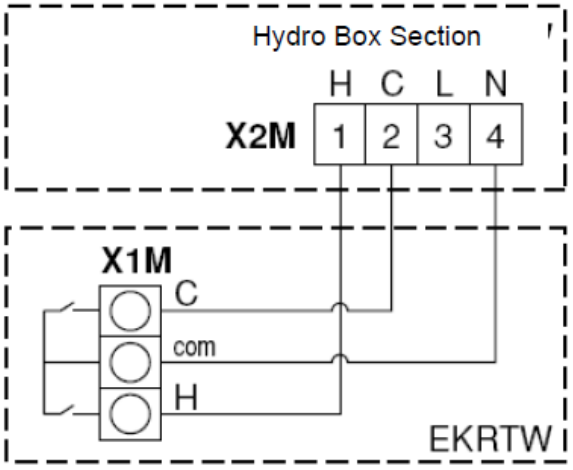
2.2 Dimensions - Room Thermostat



2.3 Application Example - Room Thermostat



2.4 Wiring Connection - Room Thermostat



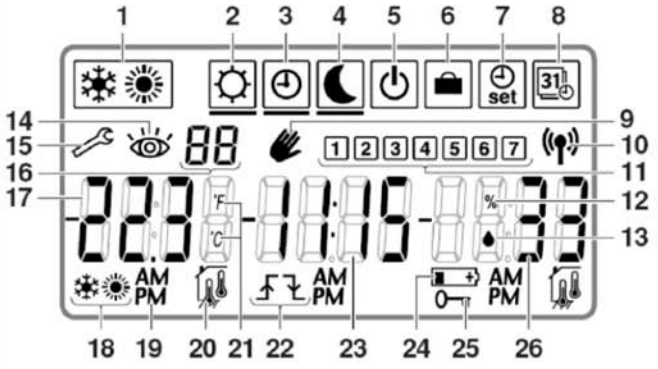
Use field supplied 18 gauge wires to connect thermostat to hydro box section terminals

H	Heating demand
C	Cooling demand

For heating-only applications, wire 2-C is not to be installed.

2.5 User Display - Room Thermostat

1	Cooling/heating mode selection
2	Comfort function mode
3	Schedule timer function mode
4	Reduced function mode
5	OFF function mode (with integrated frost protection)
6	Holiday function mode
7	Schedule timer setting menu
8	Date and clock setting menu
9	Manual override of the scheduled mode
10	Active wireless communication between thermostat and its receiver
11	Day of the week
12	Percentage sign for humidity indication
13	Not used.
14	Error occurred: intervention needed.
15	Active user or installation menu or error occurred. Refer to "Troubleshooting" on page 16.
16	Selected program (schedule timer) or code
17	Room temperature or setpoint (when flashing)



18	Thermostat ON (heating or cooling requested)
19	AM - PM indication
20	Room or floor temperature symbol. Floor temperature symbol is flashing if floor protection function is active.
21	Degrees type indication (°C or °F)
22	When manually overriding a schedule or when consulting the active scheduled setpoints by pressing ⊕ or ⊖, the current and next setpoint together with the starting hour of the next action are displayed. • ⤴ is shown in case the next action setpoint goes up. • ⤵ is shown in case the next action setpoint goes down. • ⤴⤵ is shown in case the setpoints are equal.
23	Actual time
24	"Low batteries" indication
25	Key lock function
26	Humidity indication or indication of next scheduled temperature setpoint

2.6 Functional Summary - Room Thermostat

- Room temperature control, base on the measurements of the internal sensor.
- Cooling and heating mode, with possibility to disable cooling function if not required.
- Automatic daylight-saving time change.
- Battery driven so no external power required.

The thermostats are preprogrammed with a set of 5 modes:

In the Comfort mode, the temperature is kept fixed at an adjustable set value. Default values are 70^{O}F (21^{O}C) in heating mode and 75^{O}F (24^{O}C) in cooling mode.

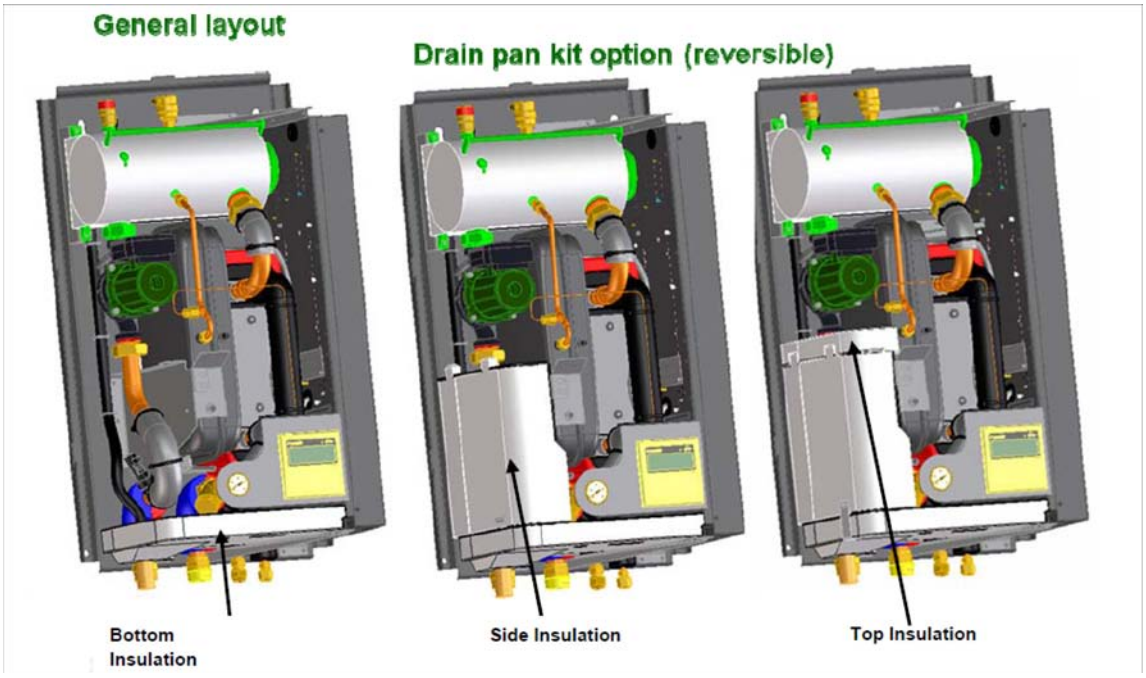
In the Reduced mode, the temperature is kept fixed at an adjustable set value. Default values are 62.5^{O}F (17^{O}C) in heating mode and 82.5^{O}F (28^{O}C) in cooling mode.

In the Off mode, the thermostat is still active as a frost protection which keeps the temperature above 39^{O}F (4^{O}C).

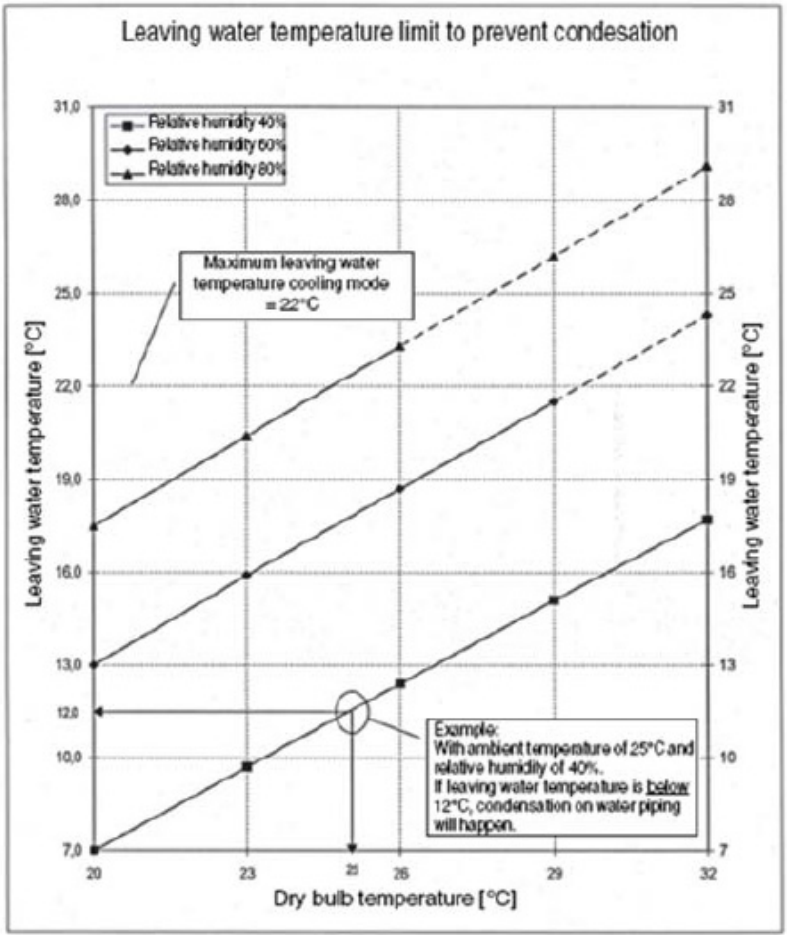
In the Holiday mode, the temperature is kept fixed at an adjustable set value. Default values are 57^{O}F (14^{O}C) in heating mode and 86^{O}F (30^{O}C) in cooling mode for a programmed duration.

In the Schedule mode, the temperature is adjusted in accordance with a pre-planned schedule of either of the preprogrammed standard schedules, or one of the 2 schedules the user can program on his own. ONe can also choose whether the programmed times are when the heat pump starts adjusting temperatures or at what time the temperatures are to be reached.

3. Condensate Kit – EKHBDP

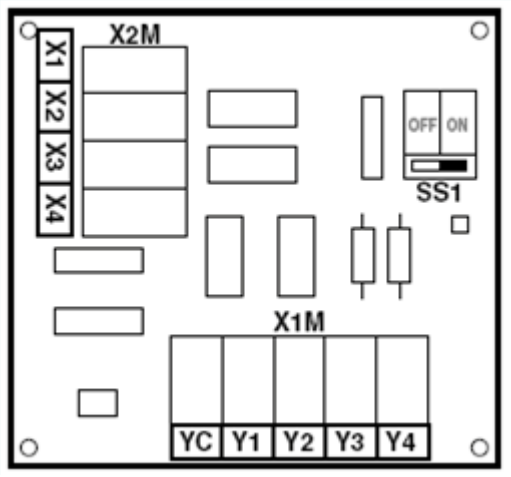


NOTE: Condensate Kit must be used with EKHBX054* Heat Pump Hydrobox



4. Digital I/O PCB Kit – EKRP1HBAAU

- An optional EKRP1HB digital I/O PCB can be connected to the indoor hydrobox or the outdoor monobloc unit and allows:
- Remote Alarm Output
- Bivalent operation (permission signal for the auxiliary boiler)
- Solar DHW priority mode
- Refer to the operation manual of the indoor unit and to the installation manual of the digital I/O PCB for more information.
- Refer to the wiring diagram or connection diagram for connecting this PCB to the unit



Appendix - Field Settings

1. Field Settings Overview

The unit shall be configured by the installer to match the installation environment (outdoor climate, installed options, etc.) and user demand. Thereto, a number of so called field settings are available. These field settings are accessible and programmable through the user interface.

Each field setting is assigned a 3-digit number or code, for example [5-03], which is indicated on the user interface display. The first digit [5] indicates the 'first code' or field setting group. The second and third digit [03] together indicate the 'second code'.

A list of all field settings and default values is given under "Field settings table" on page 35. In this same list, we provided for 2 columns to register the date and value of altered field settings at variance with the default value.

A detailed description of each field setting is given under "Detailed description" on page 26.

Procedure

To change one or more field settings, proceed as follows.

⚠ Temperature values displayed on the digital controller (user interface) are in °C.

Temperature values in °C are between brackets. Conversion from °C to °F is for information only.

1 Press the button for a minimum of 5 seconds to enter FIELD SET MODE.
The **SETTING** icon (3) will be displayed. The current selected field setting code is indicated ***8-88*** (2), with the set value displayed to the right ***-88.8*** (1).

2 Press the TEMP▲ button to select the appropriate field setting first code.

3 Press the TEMP▼ button to select the appropriate field setting second code.

4 Press the TIMER▲ button and TIMER▼ button to change the set value of the select field setting.

5 Save the new value by pressing the ⊗ button.

6 Repeat step 2 through 4 to change other field settings as required.

7 When finished, press the button to exit FIELD SET MODE.

NOTE Changes made to a specific field setting are only stored when the ⊗ button is pressed. Navigating to a new field setting code or pressing the button will discard the change made.

NOTE

- Before shipping, the set values have been set as shown under "Field settings table" on page 35.
- When exiting FIELD SET MODE, "88" may be displayed on the user interface LCD while the unit initialises itself.

Detailed description

[0] User permission level

If required, certain user interface buttons can be made unavailable for the user.

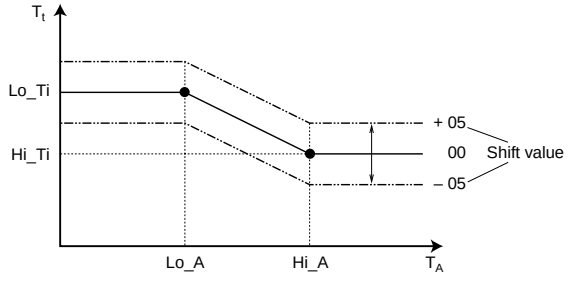
Three permission levels are defined (see the table below). Switching between level 1 and level 2/3 is done by simultaneously pressing buttons ⏲TIMER▲ and ⏲TIMER▼ immediately followed by simultaneously pressing buttons and , and keeping all 4 buttons pressed for at least 5 seconds (in normal mode). Note that no indication on the user interface is given. When level 2/3 is selected, the actual permission level — either level 2 or level 3 — is determined by the field setting [0-00].

		Permission level		
Button		**1**	**2**	**3**
Quiet mode button		operable	—	—
Weather dependent set point button		operable	—	—
Schedule timer enable/disable button		operable	operable	—
Programming button		operable	—	—
Time adjust buttons	⏲TIMER ▲ ⏲TIMER ▼	operable	—	—
Inspection/test operation button	TEST	operable	—	—

[1] Weather dependent set point (heating operation only)

The weather dependent set point field settings define the parameters for the weather dependent operation of the unit. When weather dependent operation is active the water temperature is determined automatically depending on the outdoor temperature: colder outdoor temperatures will result in warmer water and vice versa. During weather dependent operation, the user has the possibility to shift up or down the target water temperature by a maximum of 41°F (5°C). See the operation manual for more details on weather dependent operation.

- [1-00] Low ambient temperature (Lo_A): low outdoor temperature.
- [1-01] High ambient temperature (Hi_A): high outdoor temperature.
- [1-02] Set point at low ambient temperature (Lo_Ti): the target outgoing water temperature when the outdoor temperature equals or drops below the low ambient temperature (Lo_A).
  Note that the Lo_Ti value should be *higher* than Hi_Ti, as for colder outdoor temperatures (i.e. Lo_A) warmer water is required.
- [1-03] Set point at high ambient temperature (Hi_Ti): the target outgoing water temperature when the outdoor temperature equals or rises above the high ambient temperature (Hi_A).
  Note that the Hi_Ti value should be *lower* than Lo_Ti, as for warmer outdoor temperatures (i.e. Hi_A) less warm water suffices.



T_t Target water temperature

T_A Ambient (outdoor) temperature

Shift value = Shift value

[2] Disinfection function

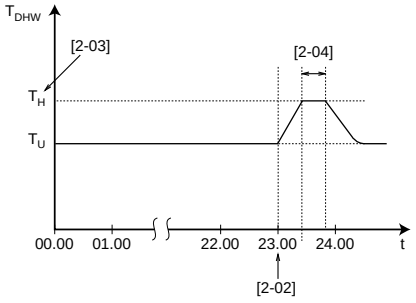
Applies only to installations with a domestic hot water tank.

The disinfection function disinfects the domestic hot water tank by periodically heating the domestic water to a specific temperature.

CAUTION

The disinfection function field settings must be configured by the installer according to local laws and regulations.

- [2-00] Operation interval: day(s) of the week at which the domestic water should be heated.
- [2-01] Status: defines whether the disinfection function is turned on (1) or off (0).
- [2-02] Start time: time of the day at which the domestic water should be heated.
- [2-03] Set point: high water temperature to be reached.
- [2-04] Interval: time period defining how long the set point temperature should be maintained.



T_{DHW}	Domestic hot water temperature
T_U	User set point temperature (as set on the user interface)
T_H	High set point temperature [2-03]
t	Time

WARNING

Be aware that the domestic hot water temperature at the hot water tap will be equal to the value selected in field setting [2-03] after a disinfection operation.

If this high domestic hot water temperature can be a potential risk for human injuries, a mixing valve (field supply) shall be installed at the hot water outlet connection of the domestic hot water tank. This mixing valve shall secure that the hot water temperature at the hot water tap never rise above a set maximum value. This maximum allowable hot water temperature shall be selected according to local laws and regulations.

[3] Auto restart

When power returns after a power supply failure, the auto restart function reapplies the user interface settings at the time of the power supply failure.

NOTE It is therefore recommended to leave the auto restart function enabled.

Note that with the function disabled the schedule timer will not be activated when power returns to the unit after a power supply failure. Press the ⏲⊗ button to enable the schedule timer again.

- [3-00] Status: defines whether the auto restart function is turned **ON (0)** or **OFF (1)**.

NOTE If the benefit kWh rate power supply is of the type that power supply is interrupted, then always allow the auto restart function.

[4] Backup heater operation and space heating off temperature

Backup heater operation

The operation of the backup heater can be enabled or disabled, or it can be disabled depending on operation of the booster heater.

- [4-00] Status: defines whether backup heater operation is enabled (1) or disabled (0).

NOTE Even in case the backup heater operation status field setting [4-00] is set to disabled (0), the backup heater can operate during start-up and defrost operation.

- [4-01] Priority: defines whether backup heater and booster heater can operate simultaneously (0), or if the booster heater operation has priority over the backup heater operation (1), or if the backup heater operation has priority over the booster heater operation (2).

NOTE When the priority field setting is set to ON (1), space heating performance of the system might be decreased at low outdoor temperatures, since in case of domestic water heating demand the backup heater will not be available for space heating (space heating will still be provided by the heat pump).

When the priority field setting is set to ON (2), domestic water heating performance of the system might be decreased at low outdoor temperatures, since in case of space heating demand the booster heater will not be available for domestic water heating. However domestic water heating by heat pump will still be available.

When the priority field setting is set to OFF (0), make sure that electrical power consumption does not exceed supply limits.

Space heating off temperature

- [4-02] Space heating off temperature: outdoor temperature above which space heating is turned off, to avoid overheating.

Booster heater operation

Applies only to installations with a domestic hot water tank.

The operation of the booster heater can be enabled or limited depending on outdoor temperature (T_A), domestic hot water temperature (T_{DHW}) or operation mode of the heat pump.

- [4-03] Booster heater operation: defines whether the optional booster heater operation is enabled (1) or has certain limitations (0/2/3).

Explanation of settings of [4-03]

Booster heater will/can only operate if domestic hot water mode is activated ( ).

- [4-03]=0, then booster heater operation is only allowed during "[2] Disinfection function" and "Powerful domestic water heating" (see operation manual).
  This setting is only recommended in case the capacity of the heat pump can cover the heating requirements of the house and domestic hot water over the complete heating season.
  The result of this setting is that the domestic hot water will never be heated by the booster heater except for "[2] Disinfection function" and "Powerful domestic water heating" (see operation manual).

If the booster heater operation is limited ([4-03]=0) and the ambient outdoor temperature T_A is lower than the field setting to which parameter [5-03] is set and [5-02]=1, then the domestic hot water will not be heated.

The consequence of this setting is that the domestic hot water temperature (T_{DHW}) can be maximum the heat pump OFF temperature ($T_{HP\ OFF}$). Refer to setting of [6-00] and [6-01] in "[6]" on page 29.

- [4-03]=1, then booster heater heater operation is only determined by booster heater OFF temperature ($T_{BH\ OFF}$), booster heater ON temperature ($T_{BH\ ON}$) and/or schedule timer. Refer to setting "[7-00]" on page 30 and "[7-01]" on page 30.
- [4-03]=2, then booster heater operation is only allowed if heat pump is out of "operation range" of heat pump domestic water heating mode (T_A<[5-03] or T_A>95°F(35°C)) or domestic hot water temperature is 3.6°F (2°C) lower then the heat pump OFF temperature ($T_{HP\ OFF}$) for domestic hot water mode (T_{DHW}>$T_{HP\ OFF}$–3.6°F(2°C)). (Refer to setting [5-03] on page 28, [6-00] on page 29 and [6-01] on page 29). Results in the most optimum coverage of domestic hot water heated by the pump.
- [4-03]=3, then booster heater operation is the same as setting 1, except that booster heater is OFF when the heat pump is active in domestic hot water mode. The consequence of this functionality is that setting [8-03] is not relevant.
  Results in optimum coverage of domestic hot water heated by heat pump in relation with [8-04].

- When setting [4-03]=1/2/3, the booster heater operation can still be restricted by the schedule timer as well. I.e., when booster heater operation is preferred during certain period of the day. (See operation manual)
- When setting [4-03]=2, the booster heater will be allowed to operate when T_A<[5-03] independent of the status of [5-02]. If bivalent operation is enabled and permission signal for auxiliary boiler is ON, the booster heater will be restricted even when T_A<[5-03]. (See "[C-02]" on page 33).
- Booster heater is always allowed during powerful and disinfection function, except for the period that the backup heater operation is required for safety reasons and [4-02]=1.

- [4-04] Freeze protection function: avoids freezing of the water piping between home and unit. In case of low ambient temperatures it will activate the pump and in case of low water temperatures it will additionally activate the backup heater. Monobloc only.
  Default freeze protection function takes into account freezing of water piping which is insufficiently insulated.
  Basically it means that the pump is activated whenever ambient temperatures become close to freezing, independently of the working temperature.

[5] Equilibrium temperature and space heating priority temperature

Equilibrium temperature — The 'equilibrium temperature' field settings apply to operation of the **backup heater**.
When the equilibrium temperature function is enabled, operation of the backup heater is restricted to low outdoor temperatures, i.e. when the outdoor temperature equals or drops below the specified equilibrium temperature. When the function is disabled, operation of the backup heater is possible at all outdoor temperatures. Enabling this function reduces the working time of the backup heater.

- [5-00] Equilibrium temperature status: specifies whether the equilibrium temperature function is enabled (1) or disabled (0).
- [5-01] Equilibrium temperature: outdoor temperature below which operation of the backup heater is allowed.

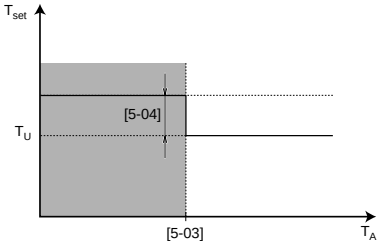
Space heating priority temperature — Applies only to installations with a domestic hot water tank. — The 'space heating priority temperature' field settings apply to operation of the 3-way valve and the **booster heater** in the domestic hot water tank.
When the space heating priority function is enabled, it is assured that the full capacity of the heat pump is used for space heating only when the outdoor temperature equals or drops below the specified space heating priority temperature, i.e. low outdoor temperature. In this case the domestic hot water will only be heated by the booster heater.

- [5-02] Space heating priority status: specifies whether space heating priority is enabled (1) or disabled (0).
- [5-03] Space heating priority temperature: outdoor temperature below which the domestic hot water will be heated by the booster heater only, i.e. low outdoor temperature.

If the booster heater operation is limited ([4-03]=0) and the ambient outdoor temperature T_A is lower than the field setting to which parameter [5-03] is set and [5-02]=1, then the domestic hot water will not be heated.

MONOBLOC ONLY

■ [5-04] Set point correction for domestic hot water temperature: set point correction for the desired domestic hot water temperature, to be applied at low outdoor temperature when space heating priority is enabled. The corrected (higher) set point will make sure that the *total* heat capacity of the water in the tank remains approximately unchanged, by compensating for the colder bottom water layer of the tank (because the heat exchanger coil is not operational) with a warmer top layer.



T_{set}	Domestic hot water set point temperature
T_U	User set point (as set on the user interface)
T_A	Ambient (outdoor) temperature
	Space heating priority

WARNING

Be aware that the domestic hot water temperature will be automatically increased with the value selected in field setting [5-04] (if the outdoor temperature drops below field setting [5-03]) compare to the user set point for domestic hot water (T_U). Refer to field setting [5-03], [7-00] and the operation manual to select preferable set point.

If this high domestic hot water temperature can be a potential risk for human injuries, a mixing valve (field supply) shall be installed at the hot water outlet connection of the domestic hot water tank. This mixing valve shall secure that the hot water temperature at the hot water tap never rise above a set maximum value. This maximum allowable hot water temperature shall be selected according to local laws and regulations.

[6] DT for heat pump domestic water heating mode

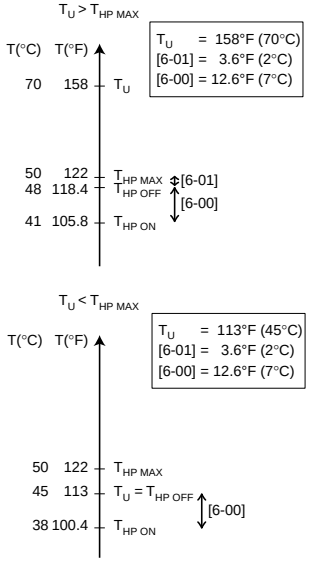
Applies only to installations with a domestic hot water tank.

The 'DT (temperature difference) for heat pump domestic water heating mode' field settings determine the temperatures at which heating of the domestic hot water by the heat pump will be started (i.e., the heat pump ON temperature) and stopped (i.e., the heat pump OFF temperature).
When the domestic hot water temperature drops below the heat pump ON temperature ($T_{HP\ ON}$), heating of the domestic hot water by the heat pump will be started. As soon as the domestic hot water temperature reaches the heat pump OFF temperature ($T_{HP\ OFF}$) or the user set point temperature (T_U), heating of the domestic hot water by the heat pump will be stopped (by switching the 3-way valve).

The heat pump OFF temperature, and the heat pump ON temperature, and its relation with field settings [6-00] and [6-01] are explained in the illustration below.

■ [6-00] Start: temperature difference determining the heat pump ON temperature ($T_{HP\ ON}$). See illustration.

■ [6-01] Stop: temperature difference determining the heat pump OFF temperature ($T_{HP\ OFF}$). See illustration.



T_U	User set point temperature (as set on the user interface)
$T_{HP\ MAX}$	Maximum heat pump temperature at sensor in domestic hot water tank (122°F)(50°C)(depending on T_A)[(a)]
$T_{HP\ OFF}$	Heat pump OFF temperature
$T_{HP\ ON}$	Heat pump ON temperature

(a) 122°F (50°C) = $T_{HP\ MAX}$ at T_A≤77°F (25°C).
118.4°F (48°C) = $T_{HP\ MAX}$ at T_A>77°F (25°C).

The maximum domestic hot water temperature that can be reached with the heat pump is 122°F (50°C). It is advised to select $T_{HP\ OFF}$ not higher than 118.4°F (48°C) in order to improve performance of the heat pump during domestic water heating mode.

When setting [4-03]=0 or 2 special attention to setting [6-00] is recommended. A good balance between the required domestic hot water temperature and heat pump ON temperature ($T_{HP\ ON}$) is a must.

[7] DT for booster heater and dual set point control

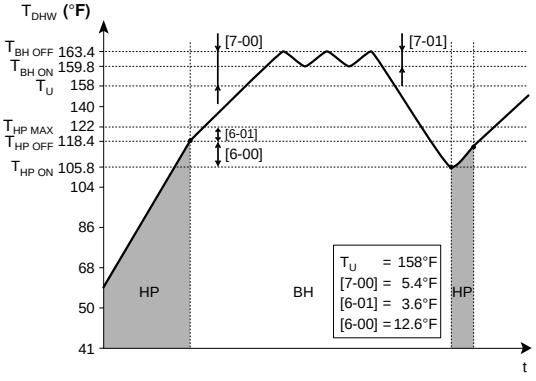
DT for booster heater

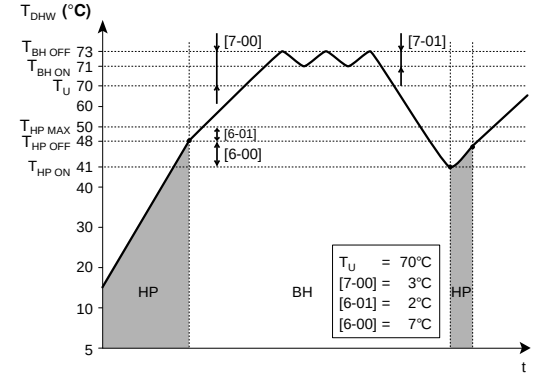
Applies only to installations with a domestic hot water tank.

When the domestic hot water is heated and the domestic hot water set point temperature (as set by the user) has been reached, the booster heater will continue to heat the domestic hot water to a temperature a few degrees above the set point temperature, i.e. the booster heater OFF temperature. These extra degrees are specified by the domestic hot water step length field setting. Correct setting prevents the booster heater from repeatedly turning on and off (i.e. chattering) to maintain the domestic hot water set point temperature. Note: the booster heater will turn back on when the domestic hot water temperature drops [7-01] (field setting) below the booster heater OFF temperature.

If the schedule timer for booster heater (see the operation manual) is active, the booster heater will only operate if allowed by this schedule timer.

■ [7-00] Domestic hot water step length: temperature difference above the domestic hot water set point temperature before the booster heater is turned off.





BH	Booster heater
HP	Heat pump. If heating up time by the heat pump takes too long, auxiliary heating by the booster heater can take place
$T_{BH\ OFF}$	Booster heater OFF temperature (T_U + [7-00])
$T_{BH\ ON}$	Booster heater ON temperature (($T_{BH\ OFF}$ – 4°F) ($T_{BH\ OFF}$ – 2°C))
$T_{HP\ MAX}$	Maximum heat pump temperature at sensor in domestic hot water tank
$T_{HP\ OFF}$	Heat pump OFF temperature ($T_{HP\ MAX}$ – [6-01])
$T_{HP\ ON}$	Heat pump ON temperature ($T_{HP\ OFF}$ – [6-00])
T_{DHW}	Domestic hot water temperature
T_U	User set point temperature (as set on the user interface)
t	Time

WARNING

Be aware that the domestic hot water temperature will be automatically increased (always) with the value selected in field setting [7-00] compare to the user set point for domestic hot water (T_U). Refer to field setting [7-00] and the operation manual to select preferable set point.

If this high water temperature can be a potential risk for human injuries, a mixing valve (field supply) shall be installed at the hot water outlet connection of the domestic hot water tank. This mixing valve shall secure that the hot water temperature at the hot water tap never rise above a set maximum value. This maximum allowable hot water temperature shall be selected according to local laws and regulations.

If the booster heater operation is limited ([4-03]=0), then set point of field setting parameter [7-00] has only meaning for powerful domestic water heating.

■ [7-01] Hysteresis value booster heater: temperature difference determining the booster heater ON temperature ($T_{BH\ ON}$). $T_{BH\ ON} = T_{BH\ OFF} – [7\text{-}01]$

The minimum value for booster heater ON temperature ($T_{BH\ ON}$) is 3.6°F (2°C) (fixed) below heat pump OFF temperature ($T_{HP\ OFF}$).

Dual set point control

Applies only to installations with different heat emitter which require different set points.

Dual set point control makes it possible to generate 2 different set points.

NOTE There is no indication available which set point is active!

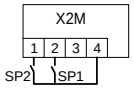
■ [7-02] Dual set point control status: defines whether the dual set point control is enabled (1) or disabled (0).

■ [7-03] Second set point heating: specifies the second set point temperature in heating operation.

■ [7-04] Second set point cooling: specifies the second set point temperature in cooling operation.

NOTE

- The first set point heating/cooling is the set point selected on the user interface.
  - In heating mode the first set point can be a fixed value or weather dependent.
  - In cooling mode the first set point is always a fixed value.
- The second set point heating [7-03] should be linked to the heat emitters which requires the highest set point in heating mode. Example: fan coil unit.
- The second set point cooling [7-04] should be linked to the heat emitters which requires the lowest set point in cooling mode. Example: fain coil unit.
- The actual second set point heating value depends on the selected value of setting [7-03].
  - In case [7-03]=1.8~43.2°F (1~24°C), the actual second set point will be first set point heating increased with [7-03] (the maximum is 131°F (55°C)).
    In this way the second set point heating is linked to the first set point heating.
  - In case [7-03]=77~131°F (25~55°C), the actual second set point heating is equal to [7-03].
- The selection of second set point or first set point is determined by the terminals (X2M: 1, 2, 4).
  The second set point has always priority on the first set point.



SP1 First set point contact

SP2 Second set point contact

When dual set point control is enabled, heating/cooling selection always has to be done on the user interface.

NOTE

It is the responsibility of the installer to make sure no unwanted situations can occur.

It is very important that the water temperature to the floor heating loops never becomes too high in heating mode or never too cold in cooling mode. Failure to observe this rule can result in construction damage or discomfort. For example in cooling mode condensation on the floor can occur when water towards the floor heating loops is too cold (dew point).

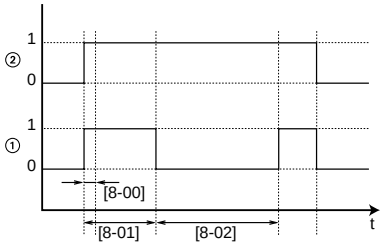
[8] Domestic water heating mode timer

Applies only to installations with a domestic hot water tank.

The 'domestic water heating mode timer' field settings defines the minimum and maximum domestic water heating times, minimum time between two domestic water heating cycles by heat pump, and booster heater delay time.

- [8-00] Minimum running time: specifies the minimum time period during which heat pump domestic water heating mode should be activated, even when the target domestic hot water temperature for heat pump ($T_{HP\ OFF}$) has already been reached.
- [8-01] Maximum running time: specifies the maximum time period during which heat pump domestic water heating mode can be activated, even when the target domestic hot water temperature for heat pump ($T_{HP\ OFF}$) has not yet been reached.
  The actual maximum running time will automatically variate between [8-01] and [8-01]+[8-04] depending on the outdoor temperature. See figure in chapter "[8-04]" on page 32.

  Note that when the unit is configured to work with a room thermostat (refer to "Room thermostat installation configuration" on page 23), the maximum running timer will only be taken into account when there is a request for space cooling or space heating. When there is no request for room cooling or room heating, domestic water heating by the heat pump will continue until the 'heat pump OFF temperature' (see field settings [6] on page 29) is reached. When no room thermostat is installed, the timer is always taken into account.
- [8-02] Anti-recycling time: specifies the minimum required interval between two heat pump domestic water heating mode cycles.
  The actual anti-recycling time will automatically variate between [8-02] and 0 depending on the outdoor temperature. See figure in chapter "[8-04]" on page 32.



1 Domestic water heating (1 = active, 0 = not active)

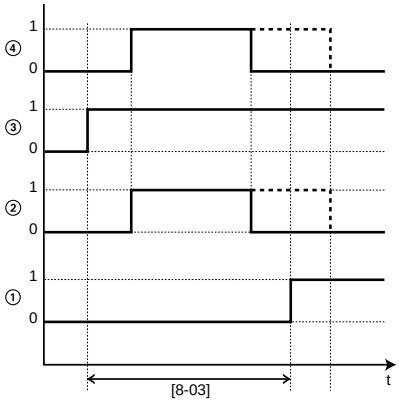
2 Hot water request (1 = request, 0 = no request)

t Time

If the outdoor temperature is higher than the field setting to which parameter [4-02] is set, then field settings of parameters [8-01], [8-02], and [8-04] are not considered.

■ [8-03] Booster heater delay time: specifies the start-up time delay of the booster heater operation when heat pump domestic water heating mode is active.

- When heat pump is active in domestic water heating mode, the delay time of booster heater is [8-03].
- When heat pump is not active in domestic water heating mode, the delay time is 20 min.
- The delay timer starts from booster heater ON temperature ($T_{BH\ ON}$)



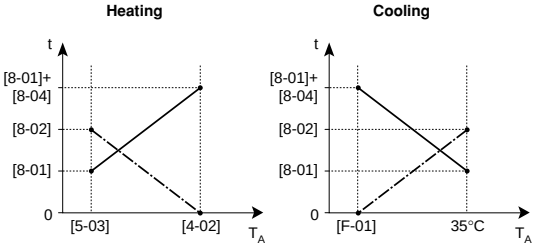
1 Booster heater operation (1 = active, 0 = not active)
2 Heat pump domestic water heating mode (1 = active, 0 = not active)
3 Hot water request for booster heater (1 = request, 0 = no request)
4 Hot water request for heat pump (1 = request, 0 = no request)
t Time

- By adapting the booster heater delay time versus the maximum running time, an optional balance can be found between the energy efficiency and the heat up time.
- However, if the booster heater delay time is set too high, it might take a long time before the domestic hot water reaches its set temperature upon domestic hot water mode request.
- The purpose of [8-03] is to delay the booster heater in relation with the heat pump operation time in domestic water heating mode.
- The setting [8-03] has only meaning if setting [4-03]=1. Setting [4-03]=0/2/3 limits the booster heater automatically in relation to heat pump operation time in domestic water heating mode.
- Take care that [8-03] is always in relation with the maximum running time [8-01].

Example: [4-03]=1

	Energy saving settings	Quick heating settings (default)
[8-01]	20~95 min	30 min
[8-03]	[8-01] + 20 min	20 min

■ [8-04] Additional running time at [4-02]/[F-01]: specifies the additional running time on the maximum running time at outdoor temperature [4-02] or [F-01]. See figure below.



t Time
T_A Ambient (outdoor) temperature
maximum running time
anti-recycle time

The full advantage of [8-04] will be applicable if setting [4-03] is not 1.

[9] The purpose of this field setting is to prevent the user from selecting a wrong (i.e., too hot or too cold) leaving water temperature. Thereto the heating temperature set point range and the cooling temperature set point range available to the user can be configured.

CAUTION

- In case of a floor heating application, it is important to limit the maximum leaving water temperature at heating operation according to the specifications of the floor heating installation.
- In case of a floor cooling application, it is important to limit the minimum leaving water temperature at cooling operation (field setting of parameter [9-03]) to 60.8~64.4°F (16~18°C) to prevent condensation on the floor.

- [9-00] Heating set point upper limit: maximum leaving water temperature for heating operation.
- [9-01] Heating set point lower limit: minimum leaving water temperature for heating operation.
- [9-02] Cooling set point upper limit: maximum leaving water temperature for cooling operation.
- [9-03] Cooling set point lower limit: minimum leaving water temperature for cooling operation.
- [9-04] Overshoot setting: defines how much the water temperature may rise above the set point before the compressor stops. This function is only applicable in heating mode.

[A] Quiet mode

This field setting allows to select the desired quiet mode. Two quiet modes are available: quiet mode A and quiet mode B.

In quiet mode A, priority is given to the unit operating quietly under **all** circumstances. Fan and compressor speed (and thus performance) will be limited to a certain percentage of the speed at normal operation. In certain cases, this might result in reduced performance.

In quiet mode B, quiet operation might be overridden when higher performance is required. In certain cases, this might result in less quiet operation of the unit to meet the requested performance.

- [A-00] Quiet mode type: defines whether quiet mode A (0) or quiet mode B (2) is selected.
- [A-01] Parameter 01: do not change this setting. Leave it set to its default value.

NOTE Do not set other values than the ones mentioned.

[C] Setup on EKRP1HB digital I/O PCB

Solar priority mode

- [C-00] Solar priority mode setting: for information concerning the EKSOLHW solar kit, refer to the installation manual of that kit.

Alarm output logic

- [C-01] Alarm output logic: defines the logic of the alarm output on the EKRP1HB digital I/O PCB.
  [C-01]=0, the alarm output will be powered when an alarm occurs (default).
  [C-01]=1, the alarm output will not be powered when an alarm occurs. This field setting allows for distinction between detection of an alarm and detection of a power failure to the unit.

[C-01]	Alarm	No alarm	No power supply to unit
0 (default)	Closed output	Open output	Open output
1	Open output	Closed output	Open output

Bivalent operation

Applies only to installations with an auxiliary boiler (alternating operation, parallel connected). The purpose of this function is to determine —based on the outdoor temperature— which heating source can/will provide the space heating, either the Daikin unit or an auxiliary boiler.

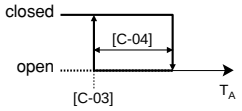
The field setting "bivalent operation" apply only the unit space heating operation and the permission signal for the auxiliary boiler.

When the "bivalent operation" function is enabled, the unit will stop automatically in space heating operation when the outdoor temperature drops below "bivalent ON temperature" and the permission signal for the auxiliary boiler becomes active.

When the bivalent operation function is disabled, the space heating by unit is possible at all outdoor temperatures (see operation ranges) and permission signal for auxiliary boiler is always disactivated.

- [C-02] Bivalent operation status: defines whether bivalent operation is enabled (1) or disabled (0).
- [C-03] Bivalent ON temperature: defines the outdoor temperature below which the permission signal for the auxiliary boiler will be active (closed, KCR on EKRP1HB) and space heating by indoor unit will be stopped.
- [C-04] Bivalent hysteresis: defines the temperature difference between bivalent ON temperature and bivalent OFF temperature.

Permission signal X1–X2 (EKRP1HB)



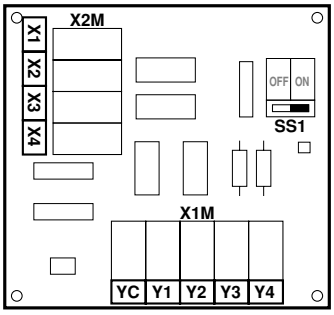
T_A Outdoor temperature

CAUTION

Make sure to observe all rules mentioned in application 5 when bivalent operation function is enabled.

Daikin shall not be held liable for any damage resulting from failure to observe this rule.

- In case the unit is single phase, the combination of setting [4-03]=0/2 with bivalent operation at low outdoor temperature can result in domestic hot water shortage.
- The bivalent operation function has no impact on the domestic water heating mode. The domestic hot water is still and only heated by the unit.
- The permission signal for the auxiliary boiler is located on the EKRP1HB (digital I/O PCB). When it is activated, the contact X1, X2 is closed and open when it is disactivated. See figure for the schematic location of this contact.



[D] Benefit kWh rate power supply/Local shift value weather dependent

Benefit kWh rate power supply

- [D-00] Switching off heaters: Defines which heaters are switched off when the benefit kWh rate signal of the electricity company is received.
  If [D-01]=1 or 2 and the benefit kWh rate signal of the electricity company is received, following devices will be switched off:

[D-00]	Compressor	Back up heater	Booster heater
0 (default)	Forced off	Forced off	Forced off
1	Forced off	Forced off	Permitted
2	Forced off	Permitted	Forced off
3	Forced off	Permitted	Permitted

[D-00] settings 1, 2 and 3 are only meaningful if the benefit kWh rate power supply is of the type that power supply is not interrupted,

Field settings table

Temperature values displayed on the digital controller (user interface) are in °C.

Temperature values in °C are between brackets. Conversion from °C to °F is for information only.

First code	Second code	Setting name	Installer setting at variance with default value				Default value	Range	Step	Unit
			Date	Value	Date	Value				
0	**User permission level**									
	00	User permission level					3	2/3	1	—
1	**Weather dependent set point**									
	00	Low ambient temperature (Lo_A)					14 (–10)	–4~41 (–20~5)	1.8 (1)	°F (°C)
	01	High ambient temperature (Hi_A)					59 (15)	50~68 (10~20)	1.8 (1)	°F (°C)
	02	Set point at low ambient temperature (Lo_TI)					104 (40)	77~131 (25~55)	1.8 (1)	°F (°C)
	03	Set point at high ambient temperature (Hi_TI)					77 (25)	77~131 (25~55)	1.8 (1)	°F (°C)
2	**Disinfection function**									
	00	Operation interval					Fri	Mon~Sun, All	—	—
	01	Status					1 (ON)	0/1	—	—
	02	Start time					23:00	0:00~23:00	1:00	hour
	03	Set point					158 (70)	104~176 (40~80)	9 (5)	°F (°C)
	04	Interval					10	5~60	5	min
3	**Auto restart**									
	00	Status					0 (ON)	0/1	—	—
4	**Backup/booster heater operation and space heating off temperature**									
	00	Status					1 (ON)	0/1	—	—
	01	Priority					0 (OFF)	0/1/2	—	—
	02	Space heating off temperature					95 (35)	57.2~95 (14~35)	1.8 (1)	°F (°C)
	03	Booster heater operation					3	0/1/2/3	—	—
	04	Freeze-up protection function (monobloc only)					0 (active) Read only	—	—	—
5	**Equilibrium temperature and space heating priority temperature**									
	00	Equilibrium temperature status					1 (ON)	0/1	—	—
	01	Equilibrium temperature					32 (0)	5~95 (–15~35)	1.8 (1)	°F (°C)
	02	Space heating priority status					0 (OFF)	0/1	—	—
	03	Space heating priority temperature					32 (0)	5~68 (–15~20)	1.8 (1)	°F (°C)
	04	Set point correction for domestic hot water temperature					18 (10)	0~36 (0~20)	1.8 (1)	°F (°C)
6	**DT for heat pump domestic water heating mode**									
	00	Start					3.6 (2)	3.6~36 (2~20)	1.8 (1)	°F (°C)
	01	Stop					3.6 (2)	0~18 (0~10)	1.8 (1)	°F (°C)
	02	Not applicable					0	Read only	—	—
7	**DT for booster heater and dual set point control**									
	00	Domestic hot water step length					0	0~7.2 (0~4)	1.8 (1)	°F (°C)
	01	Hysteresis value booster heater					3.6 (2)	3.6~72 (2~40)	1.8 (1)	°F (°C)
	02	Dual set point control status					0	0/1	—	—
	03	Second set point heating					18 (10)	1.8~43.2 / 77~131 (1~24 / 25~55)	1.8 (1)	°F (°C)
	04	Second set point cooling					44.6 (7)	41~71.6 (5~22)	1.8 (1)	°F (°C)
8	**Domestic water heating mode timer**									
	00	Minimum running time					5	0~20	1	min
	01	Maximum running time					30	5~60	5	min
	02	Anti-recycling time					3	0~10	0.5	hour
	03	Booster heater delay time					50	20~95	5	min
	04	Additional running time at [4-02]/[F-01]					95	0~95	5	min

First code	Second code	Setting name	Installer setting at variance with default value Date	Value	Date	Value	Default value	Range	Step	Unit
9	**Cooling and heating set point ranges**									
	00	Heating set point upper limit					131 (55)	98.6~131 (37~55)	1.8 (1)	°F (°C)
	01	Heating set point lower limit					77 (25)	59~98.6 (15~37)	1.8 (1)	°F (°C)
	02	Cooling set point upper limit					71.6 (22)	64.4~71.6 (18~22)	1.8 (1)	°F (°C)
	03	Cooling set point lower limit					41 (5)	41~64.4 (5~18)	1.8 (1)	°F (°C)
	04	Overshoot setting[(a)]					1.8 (1)	1.8~7.2 (1~4)	1.8 (1)	°F (°C)
A	**Quiet mode**									
	00	Quiet mode type					0	0/2	—	—
	01	Parameter 01					3	—	—	—
	02	Not applicable					1	Read only	—	—
	03	Not applicable					0	Read only	—	—
	04	Not applicable					0	Read only	—	—
b	Not applicable									
	00	Not applicable					0	Read only	—	—
	01	Not applicable					0	Read only	—	—
	02	Not applicable					0	Read only	—	—
	03	Not applicable					0	Read only	—	—
	04	Not applicable					0	Read only	—	—
C	**Setup on EKRP1HB digital I/O PCB**									
	00	Solar priority mode setting					0	0/1	1	—
	01	Alarm output logic					0	0/1	—	—
	02	Bivalent operation status					0	0/1	—	—
	03	Bivalent ON temperature					32 (0)	–13~77 (–25~25)	1.8 (1)	°F (°C)
	04	Bivalent hysteresis					5.4 (3)	3.6~18 (2~10)	1.8 (1)	°F (°C)
D	**Benefit kWh rate power supply/local shift value weather dependent**									
	00	Switching off heaters					0	0/1/2/3	—	—
	01	Unit connection to benefit kWh ate power supply					0 (OFF)	0/1/2	—	—
	02	Not applicable. Do not change the default value.					0	—	—	—
	03	Local shift value weather dependent					0	0/1/2/3/4	—	—
E	**Unit information readout**									
	00	Software version					Read only	—	—	—
	01	EEPROM version					Read only	—	—	—
	02	Unit model identificatio					Read only	—	—	—
	03	Liquid refrigerant temperature					Read only	—	—	°F (°C)
	04	Inlet water temperature					Read only	—	—	°F (°C)
F	**Option setup**									
	00	Pump operation					0	0/1	—	—
	01	Space cooling permission temperature					68 (20)	50~95 (10~35)	1.8 (1)	°F (°C)
	02	Bottom plate heater ON temperature					37.4 (3)	37.4~50 (3~10)	1.8 (1)	°F (°C)
	03	Bottom plate heater hysteresis					9 (5)	3.6~9 (2~5)	1.8 (1)	°F (°C)
	04	Functionality of X14A					1	0/1	—	—

(a) Only possible to modify the first 3 mi utes after power ON.

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Daikin's unique position as a manufacturer of air conditioning equipment, compressors and refrigerants has led to its close involvement in environmental issues. For several years, Daikin has had the intention of becoming a leader in the the provision of products that have limited impact on the environment. This challenge demands the eco design and development of a wide range of products and an energy management system, resulting in energy conservation and reduction of waste.

ISO14001 assures an effective environmental management system in order to help protect human health and the environment from the potential impact of our activities, products, and services and to assist in maintaining and improving the quality of the environment.

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Daikin units comply with the European regulations that guarantee the safety of the product.

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